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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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February 10, 1976

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

February 10, 1976 Volume 943 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Second Trial Voluntary Protest Program

A Second Trial Voluntary Protest Program will be conducted during the coming months. It will be increased in scale and somewhat modified in procedure from the first such program. Announcement of and description of the rules for the first program appeared in 923 O.G. 2 on June 4, 1974.

As before, the objective is to gain experience in carrying out such a program and to determine the extent of interest by the public in participating and in supplying pertinent references. To the extent there is participation, the program should be beneficial by bringing new art to the attention of the Office, preventing inadvertent issuance of invalid patents, and increasing confidence in the strength of those patents which survive the protest proceedings.

The first Trial Voluntary Protest Program showed a considerable interest by applicants and the public in taking part in protest proceedings. A summary of the results will be published soon in this Gazette. The second Trial Voluntary Protest Program is designed to gain additional information as to public participation and also to follow more closely the procedures which would be required in a continuing, permanent protest program.

Applications Involved

In the second Trial Voluntary Protest Program, a Request to Participate and Waiver of Confidentiality form (PTOL–224 Temp.) will be sent to each applicant to whom a Notice of Allowance is mailed during a selected three week period, probably in October, 1975. The total number of requests mailed will be about 4,500. Applications for plant patents will be excluded from the program. The reason for this exclusion is the high cost of printing colored drawings and the relatively limited prior art available. No other applications will be excluded from the trial program, regardless of subject matter, type of application or earlier proceedings.

Waiver of Confidentiality

Two copies of the form letter requesting voluntary waiver of confidentiality (form PTOL–224 Temp.) will be mailed in the same envelope along with the Notice of Allowance. An additional copy of the form letter will be made of record in each application at the time of mailing. The applicant will have three months from the notice of allowance date in which to either (1) elect to participate in the Trial Voluntary Protest Program by filing a signed waiver of confidentiality, or (2) elect not to participate in the program by paying the issue fee. If he does neither, the application will become abandoned, as provided in 37 C.F.R. 1.316. The waiver of confidentiality is a part of form PTOL–224 Temp. This procedure will avoid any increase in pendency time for those applications in which an election is made not to participate in the program. An early filing of a waiver of confidentiality by the applicant will result in early publication of the application.

Publication

If the applicant decides not to participate in the protest program and payment of the issue fee is timely made, the patent will issue routinely without delay.

If the applicant elects to participate in the protest program and a signed waiver of confidentiality is filed in the Office within 3 months of the notice of allowance date, the Notice of Allowance will be vacated. In such a case the issue fee should not be filed, as it will not be accepted and applied if filed with a signed waiver of confidentiality. An additional Notice of Allowance will be issued after the protest proceedings have been completed if only allowable claims remain in the application.

After a signed waiver has been filed, the application will be printed in the form of a patent and be available for sale as in the first Trial Voluntary Protest Program. At least one claim and a drawing figure, if any, will be printed in the OFFICIAL GAZETTE. These published applications will appear in about 6 to 9 issues of the OFFICIAL GAZETTE early in 1976. Advance notice will be given in the OFFICIAL GAZETTE of the dates on which applications will be published under this program.

Inspection of Files

The Patent and Trademark Office files of the published applications will be available for inspection by the public for a period of three months after publication. The application files will be retained in a single location in the Patent Issue Division during the protest period. This single location will be staffed with personnel to process papers directed to these files, supervise inspection of the files by the public, provide copies of file contents when ordered, and perform other related duties. A coin operated copying machine will also be available at this location.

Filing of Protests

Protests relating to the patentability of any published application must be filed in writing in the Patent and Trademark Office no later than three months after publication of the application. No extension of the three month protest period will be granted. Each protest must be filed in duplicate (one copy will be forwarded to the applicant and the other copy will be placed in the application file) and must indicate the grounds for protesting the allowance of any claim contained in the published application. If the protest involves prior art not of record in the application, two copies of the alleged prior art, together with an explanation of the relevance of such prior art to the allowed claims, should be included. The protester may also comment on the prior art record in the application and the manner in which it was applied.

In those applications where prima facie evidence of prior public use or sale the claimed invention is presented in accordance with 37 C.F.R. 1.292, public use proceedings will give the protester an opportunity to present evidence.

Should claims be copied from a published application for interference purposes, the applicant copying claims must also file a notice of such copying in the file of the published application to avoid the possibility of inadvertent issuance of the published application as a patent before conclusion of any interference proceedings.

For easy identification, all protests should be headed, "Protest Under Trial Voluntary Protest Program" and be addressed to:

Commissioner of Patents and Trademarks
Box TVPP
Washington, D.C. 20231

The protester should fully identify himself and include his mailing address so that communications may be addressed to him. In view of administrative problems encountered in the first Trial Voluntary Protest Program in protecting the confidentiality of the identity of protesters, no attempt will be made by the Office to maintain the confidentiality of any protester under the new program.

If no protests are received during the protest period, the application file will be rerouted for the mailing of a new Notice of Allowance. The file will not be returned to the examining group except for consideration of matters which normally require return of an allowed file.

If one or more protests are filed in an application, the application file and the protest(s) will be returned to the examining group for consideration.

Consideration of Protest

The examining group will acknowledge receipt of all protests. The authority for deciding whether or not the evidence submitted constitutes a prima facie showing of unpatentability of any allowed claim will reside with the Group Director. If the Group Director decides that no such showing has been made, the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. Protesters will be notified in such cases that prosecution has not been reopened, and the applicant will be sent a duplicate copy of all protests. The decision of the Group Di-

rector will be final and will not be subject to petition by a protester.

If the Group Director decides that the submitted evidence constitutes a prima facie showing of unpatentability of any allowed claim, prosecution of the application will be reopened. The decision to reopen prosecution will be communicated to the applicant by means of an Office action, signed by a primary examiner, rejecting any claim considered unpatentable. The duplicate copy of each protest will be mailed to the applicant with the Office action. Protesters who submitted evidence on which the rejection is based will be identified in the Office action and will also receive copies of this and subsequent Office actions. Other protesters will be notified that prosecution has been reopened, but based on evidence and for reasons other than those submitted by them and that, consequently, no further correspondence will be directed to them. The applicant will normally be given a three month shortened statutory period to respond to the Office action.

Response by the Applicant to Subsequent Office Actions

During this period, the applicant may present amended or new claims which will be subject to further consideration by the primary examiner. In order to allow protesters who submitted evidence on which a rejection in the Office action is based to participate in later prosecution and to comment upon further proceedings, applicant will be required to serve by mail upon each protester identified in the Office action, a copy of any response filed, including any appeal brief. Indication of such service will be a required component of a complete response. Applicant need only reply to the rejections and objections made in the Office action. There need be no specific response to any other points raised by the protesters.

Comment on Applicant's Response by the Protester

Each protester served will be allowed one month, running from the date applicant's response or brief is received in the Patent and Trademark Office, to file comments relating thereto. All communications from protesters must be in writing. Examiner interviews with the protesters will not be permitted. No extensions of the one month period will be granted.

Any appeal by the applicant to the Board of Appeals in a protested application will be made special and will be taken up out of order.

Conclusion of Prosecution

If, after further prosecution, the application is found to be allowable, all protesters still participating at that time will be notified and the application will be forwarded to the Patent Issue Division for mailing of a new Notice of Allowance. A decision of the primary examiner to allow an application will not be subject to petition or appeal by any protester.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Sept. 16, 1975.

[938 O.G. 945]

Identifying Application Correspondence With Issue Batch Number

Applicants or their attorney or agent can facilitate matching incoming papers with the corresponding application file by indicating the Issue Batch Number on all papers filed in the Office after receiving the Notice of Allowance and before the time the Issue Fee Receipt is received.

The Issue Batch Number is printed on the Notice of Allowance form in Box 4 in the lower left-hand corner below the address. The Issue Batch Number consists of a capital letter followed by two digits, for example; "A03," "D18," "F42," "J79." Any lower case letters before the Issue Batch Number should be ignored since they are the typist's initials. Use of the Issue Batch Numbers is important since the allowed applications are filed by these numbers.

Any paper filed receiving the Issue Fee Receipt should include the indicated patent number rather than the Issue Batch Number. At this time in the processing, the Issue Batch Number is no longer useful since the application has been removed from the batch at the time the patent number was assigned.

RICHARD J. SHAKMAN,
Assistant Commissioner for Administration.

Jan. 16, 1976.

Relocation of Customer Relations Center

In order to expand facilities in the Public Search Room of the Patent and Trademark Office, it has become necessary to relocate the Customer Relations Center.

As of January 19, 1976, the Center was moved to Building No. 2, Room 4C08. The telephone number of the Center will continue to be (703) 557-2003.

WILLIAM I. MERKIN,
Acting Assistant Commissioner for Administration.

January 1976.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,482,055, B. M. Duggar, AUREOMYCIN AND PRODUCTION OF SAME; **2,609,329**, J. G. Niedercorn, PROCESS FOR PRODUCING AUREOMYCIN; **2,734,018**, Minieri, Sokol and Firman, PROCESS FOR PREPARATION OF TETRACYCLINE AND CHLORTETRACYCLINE; **Re. 25,840**, Growich and Deduck, TETRACYCLINE FERMENTATION, filed Jan. 22, 1974, D.C. Minn. (Minneapolis), Doc. 4-74-36, *United States of America* v. *American Cyanamid Company.*

2,609,329. (See 2,482,055.)

2,734,018. (See 2,482,055.)

2,886,011, O. Kornei, MAGNETIC TRANSDUCER HEAD, filed Oct. 17, 1975, D.C., S.D. Calif. (San Diego), Doc. 75-0924-E, *Gould Inc.* v. *Eastman Technology Inc.*

2,893,992, L. H. Sternbach, 1,4-BENZODIAZEPINE-4-OXIDES, filed Jan. 20, 1975, D.C.N.J. (Newark), Doc. 75-96, *Hoffmann-La Roche, Inc.* v. *Zenith Laboratories Inc. and Paramount Surgical Supply Corp.* Consent order for permanent injunction, against the defendants, Oct. 6, 1975.

2,980,837, A. W. Vibber, TWISTING SPINDLE BALLOON CONTROL, filed Feb. 3, 1975, D.C.N.J. (Newark), Doc. 75-174, *Alfred W. Vibber* v. *Uniroyal Inc.* Order of dismissal of action, Oct. 8, 1975.

3,012,515, C. F. High, ROTOR SLIDE-TYPE PUMP WITH ROTOR OF FREE-FLOATING SEGMENTS; **3,211,598**, H. C. O'Brien, METHODS OF COATING PIPE, filed Oct. 15, 1975, D.C., E.D. Ohio (Cleveland), Doc. C-75-902, *H. C. Price Co. and Plicoflex Inc.* v. *Samuel Moore and Company.*

3,120,113, D. Silman, SELF-ADHESIVE DECORATIVE SURFACE COVERING MATERIAL, filed Aug. 7, 1973, D.C., S.D.N.Y., Doc. 73-C-3453, *National Gypsum Company* v. *United Merchants & Manufacturers, Inc.* Stipulation and order of dismissal of action, including all claims, counterclaims with prejudice, Sept. 26, 1975.

3,211,598. (See 3,012,515.)

3,565,830, Keith, Kenah and Bair, COATED FILM OF CATALYTICALLY ACTIVE OXIDE ON A REFRACTORY SUPPORT, filed Oct. 22, 1975, D.C., S.D.N.Y., Doc. 75-C-5219, *Engelhard Minerals and Chemicals Corporation* v. *Johnson, Matthey & Co. Ltd.*

3,674,401, Annis and Kyritsis, APPARATUS FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL; **3,776,989**, same, METHOD FOR INJECTION MOLDING ARTICLES OF FOAM MATERIAL INVOLVING AUTOGENOUS FLOW; **3,801,686**, Kyritsis and Simmonds, METHOD OF INJECTION MOLDING ARTICLES OF FOAM MATERIAL, filed Apr. 16, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c1056, *USM Corp.* v. *Service Plastics Inc.*

3,684,871, C. A. Schaffner, NETWORK PLOTTING SYSTEM, filed Oct. 16, 1975, D.C., N.D. Calif. (San Francisco), Doc. C-75-2185-SC, *Systonetics Inc.* v. *Project Software & Development Inc.*

3,776,989. (See 3,674,401.)

3,801,686. (See 3,674,401.)

3,884,439, J. Jeninga, GOLF BAG CRADLE-BRACKET, filed Oct. 22, 1975, D.C., E.D. Wis. (Milwaukee), Doc. 75-613, *Atlantic Products Corp.* v. *Ajay Enterprises Inc.*

3,894,356, W. B. Imhoff, DOOR COORDINATOR, filed Oct. 22, 1975, D.C., C.D. Calif. (Los Angeles), Doc. CV 75-3572-DWW, *Leigh Products Inc.* v. *Builders Brass Works Corp.*

3,905,398, Johansen, Phillippi and Green, COMPOSITE REINFORCED HOSE WHEREIN THE REINFORCING MATERIAL IS BRAIDED AROMATIC POLYAMIDE FILAMENTS, filed Oct. 20, 1975, D.C., W.D. Okla. (Oklahoma City), Doc. 75-0889-C, *Samuel Moore and Company* v. *American Hose & Reel Co. Inc.*

D. 227,352, J. Meng, PACKAGE WITH STAGGERED PRODUCT SLICES, filed Oct. 9, 1975, D.C. Minn. (Minneapolis), Doc. 4-75-C-520, *Land O'Lakes Inc.* v. *L. D. Schreiver Cheese Co., Inc.*

D. 230,527, J. L. Berkman, TAPE CARTRIDGE CABINET, filed May 12, 1975, D.C.N.J. (Newark), Doc. 75-804, *Joseph L. Berkman and Service Manufacturing Co. Inc.* v. *Peerless Vid Tronic Corp.* Consent judgment for permanent injunction, Oct. 8, 1975.

D. 232,601, Rich and Rich, MOLDED POULTRY PRODUCT, filed Oct. 21, 1975, D.C., N.D. Tex. (Dallas), Doc. CA3-75-1301, *Louis Rich Food, Inc.* v. *Plantation Foods Inc. and James Jandrain, Menguel M. Krueger.*

Re. 25,840. (See 2,482,055.)

PATENT NOTICES

Certificates of Correction for the Week of Feb. 10, 1976

Re. 28,562	3,882,771	3,907,676	3,914,531
Re. 28,595	3,884,251	3,907,828	3,914,611
D. 236,788	3,885,544	3,907,874	3,914,717
D. 236,965	3,886,147	3,907,887	3,914,749
D. 236,966	3,887,703	3,908,028	3,914,763
3,615,962	3,888,061	3,908,671	3,914,796
3,656,925	3,888,671	3,908,764	3,914,879
3,658,968	3,889,018	3,908,873	3,914,902
3,710,610	3,889,900	3,909,036	3,914,938
3,720,927	3,890,334	3,909,111	3,915,052
3,725,526	3,890,835	3,909,319	3,915,073
3,742,197	3,890,975	3,909,444	3,915,244
3,743,284	3,891,394	3,909,627	3,915,521
3,748,390	3,891,604	3,910,134	3,915,534
3,755,034	3,892,847	3,910,336	3,915,573
3,755,927	3,893,409	3,910,550	3,915,786
3,760,599	3,893,985	3,910,587	3,915,815
3,762,663	3,894,910	3,910,719	3,915,844
3,763,692	3,895,711	3,910,871	3,916,038
3,783,974	3,896,167	3,911,176	3,916,299
3,789,033	3,896,468	3,911,470	3,916,319
3,799,135	3,898,349	3,911,519	3,916,480
3,806,596	3,899,608	3,911,565	3,916,643
3,817,991	3,899,878	3,911,569	3,916,708
3,826,068	3,900,328	3,911,873	3,916,860
3,830,447	3,902,059	3,911,885	3,917,045
3,831,193	3,902,166	3,911,911	3,917,117
3,832,280	3,902,218	3,911,938	3,917,149
3,843,374	3,902,494	3,911,973	3,917,285
3,846,309	3,903,000	3,911,982	3,917,414
3,846,737	3,903,372	3,912,177	3,917,472
3,849,326	3,903,965	3,912,449	3,917,520
3,853,626	3,904,013	3,912,469	3,917,625
3,862,365	3,904,263	3,912,567	3,917,717
3,869,132	3,904,457	3,912,610	3,917,763
3,869,496	3,904,754	3,912,620	3,917,847
3,869,517	3,904,888	3,912,641	3,917,884
3,870,519	3,904,989	3,912,858	3,918,132
3,871,108	3,905,362	3,913,048	3,918,203
3,872,835	3,905,623	3,913,284	3,918,391
3,873,267	3,905,627	3,913,583	3,918,573
3,874,592	3,905,691	3,913,634	3,918,607
3,874,632	3,905,709	3,913,767	3,918,687
3,874,972	3,906,018	3,913,863	3,918,791
3,875,209	3,906,166	3,913,992	3,918,823
3,876,016	3,906,341	3,914,100	3,918,901
3,877,021	3,906,406	3,914,179	3,918,995
3,877,807	3,906,597	3,914,299	3,919,315
3,878,156	3,906,923	3,914,338	3,919,412
3,879,690	3,906,933	3,914,342	3,919,622
3,879,829	3,907,047	3,914,377	3,919,697
3,881,118	3,907,445	3,914,456	3,920,618
3,881,301	3,907,472	3,914,463	
3,881,370	3,907,557	3,914,512	

Disclaimer and Dedication

Design 236,381.—*Richard L. Evenson* and *William J. Overton,* Portland, Oreg. X-RAY FILM DUPLICATOR/SUBTRACTOR UNIT. Patent dated Aug. 19, 1975. Disclaimer and dedication filed Nov. 26, 1975, by the assignee, *Northwest Refining Company.*

Hereby disclaims and dedicates to the Public the entire term of said patent.

Adverse Decisions in Interferences

In the designated interference involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,503,289, J. I. R. Friberg, DEVICE FOR CUTTING A CONTINUOUS STRIP FROM AN ELONGATED SHEET, Interference No. 98,627, decided Oct. 15, 1975, claims 1, 2, 3, 4, 6, and 7.

Patent No. 3,592,686, R. P. Barber, G. R. Moses, and D. L. Waugh, PROCESS FOR MAKING DURABLE PRESS AND SOIL RELEASE TEXTILE AND RESULTANT ARTICLE, Interference No. 98,439, decided Aug. 29, 1975, claims 1, 2, 3, 6, 7, and 8.

Patent No. 3,632,448, M. Beltzer, ALUMINUM-HALOGEN SECONDARY BATTERY METHOD WITH MOLTEN ELECTROLYTE, Interference No. 98,236, decided Aug. 18, 1975, claims 6, 7, and 8.

Patent No. 3,649,229, F. P. Otto, LIQUID HYDROCARBON FUELS CONTAINING HIGH MOLECULAR WEIGHT MANNICH BASES, Interference No. 98,623, decided Oct. 6, 1975, claims 1, 2, 3, 4, 5, 6, 7, 8, and 9.

Patent No. 3,692,769, M. A. Weaver and J. M. Straley, AZO COMPOUNDS CONTAINING AN ARYLSULFONYL PHENYL DIAZO COMPONENT, Interference No. 98,776, decided Oct. 20, 1975, claims 1, 2, and 5.

Patent No. 3,723,399, Y. Amiard, J. P. Bellissent, and G. Marie, COPOLYMERS OF OLEFINS OR OLEFINS AND NONCONJUGATED DIENES WITH NORBORNENE DERIVATIVES, Interference No. 98,882, decided Oct. 30, 1975, claims 1, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 15, 17, 18, 19, and 20.

Patent No. 3,733,548, W. H. Coulter and W. R. Hogg, APPARATUS AND METHOD FOR MEASURING PARTICLE CONCENTRATION OF A SUSPENSION PASSING THROUGH A SENSING ZONE, Interference No. 98,718, decided Oct. 24, 1975, claims 1, 5, 6, 10, 18, 19, 20, 25, and 26.

Dedications

3,210,175.—*Geoffrey E. Barnsley,* Canterbury, Kent, England. METHOD OF INCREASING FRUIT YIELD. Patent dated Oct. 5, 1965. Dedication filed Dec. 12, 1975, by the assignee, *Shell Oil Company.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,776,394.—*Dennis Brian Miller,* Ewing Township, Mercer County, N.J. METHODS AND APPARATUS FOR IMPARTING A DESIRED ORIENTATION TO AN ARTICLE. Patent dated Dec. 4, 1973. Dedication filed Nov. 10, 1975, by the assignee, *Western Electric Company, Incorporated.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,832,603.—*Seymour R. Cray* and *Maurice D. Roush,* Chippewa Falls, Wis. INTERCONNECT TECHNIQUE FOR STACKED CIRCUIT BOARDS. Patent dated Aug. 27, 1974. Disclaimer filed Nov. 13, 1975, by the assignee, *Control Data Corporation.*

Hereby dedicates the entire term of said patent.

3,911,008.—*Michael N. Edinberry,* Dover, and *Grant W. McLay,* Sandwich, England. POLAR-SUBSTITUTED PROPANOLAMINES AS ANTI-ANGINA AND ANTI-HYPERTENSIVE AGENTS. Patent dated Oct. 7, 1975. Dedication filed Dec. 2, 1975, by the assignee, *Pfizer Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

3,419,867.—*Peter M. Pifer,* Atlanta Ga. AUTOMATIC TRACKING SYSTEM UTILIZING CODED SCAN RATE. Patent dated Dec. 31, 1968. Disclaimer filed Aug. 18, 1975, by the assignee, *Scientific-Atlanta, Inc.*

Hereby disclaims the entire term of said patent.

3,651,931.—*Du Yung Hsiung,* Park Forest, Ill. DISPENSING PACKAGE FOR TWO-PART HAIR-TREATING COMPOSITIONS. Patent dated Mar. 28, 1972. Disclaimer filed June 6, 1975, by the assignee, *The Gillette Company.*

Hereby enters this disclaimer to claim 5 of said patent.

3,669,601.—*Bruno Lainesse,* St. Hyacinthe, Quebec, Canada. APPARATUS FOR INJECTION MOLDING. Patent dated June 13, 1972. Disclaimer filed Dec. 22, 1975, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 3, 4, and 6 of said patent.

3,680,531.—*Donald H. Holdt,* Cambridge, Md. AUTOMATIC BOILER BLOWDOWN CONTROL. Patent dated Aug. 1, 1972. Disclaimer filed Nov. 10, 1975, by the assignee, *Chemed Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,687,276.—*Robert A. Pelletier,* Winter Park, Fla. SELF-PROPELLED CONVEYOR APPARATUS. Patent dated Aug. 29, 1972. Disclaimer filed Dec. 10, 1975, by the assignee, *Morgen Manufacturing Co.*

Hereby enters this disclaimer to claim 1 of said patent.

3,746,231.—*Eddy Humberto Del Rio,* Palm Beach Gardens, Fla. AUTOMATIC WEAR COMPENSATING MECHANISM. Patent dated July 17, 1973. Disclaimer filed Apr. 10, 1975, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1 through 7, inclusive of said patent.

3,756,013.—*John M. Bergey* and *Richard S. Walton,* Lancaster, Pa. SOLID STATE WATCH. Patent dated Sept. 4, 1973. Disclaimer filed Oct. 17, 1975, by the assignee, *Time Computer, Inc.*

Hereby disclaims the entire term of said patent.

3,763,179.—*Martin Gall,* Kalamazoo, Mich. 2-IMIDAZOL-1-YL BENZOPHENONES. Patent dated Oct. 2, 1973. Disclaimer filed Nov. 17, 1975, by the assignee, *The Upjohn Company.*

Hereby enters this disclaimer to claims 1 and 6 of said patent.

3,781,930.—*Melvin P. Spitz,* Beverly Hills, Calif. CONNECTING DEVICE FOR ADJUSTABLE BEDFRAME. Patent dated Dec. 25, 1973. Disclaimer filed May 19 ,1975, by the inventor.

Hereby enters this disclaimer to claims 1, 4, and 5 of said patent.

3,790,339.—*Hans Larker, Sven-Erik Isaksson, Mats Lindberg,* all of Robertsfors, and *Gunnar Granberg,* Umea, all of Sweden. CYLINDRICAL ELONGATED FURNACE FOR TREATING MATERIAL AT HIGH TEMPERATURE IN A GASEOUS ATMOSPHERE UNDER HIGH PRESSURE. Patent dated Feb. 5, 1974. Disclaimer filed Nov. 24, 1975, by the assignee, *Allmanna Svenska Elektriska Aktiebolaget.*

Hereby enter this disclaimer to claims 1, 2, 3, 8, and 9 of said patent.

3,795,347.—*Ernst Singer,* Vancouver, British Columbia, Canada. POWER PURGED LIQUID SAMPLER. Patent dated Mar. 5, 1974. Disclaimer filed Dec. 8, 1975, by the assignee, *Sirco Products, Ltd.*

Hereby enters this disclaimer to claims 1 and 10 of said patent.

3,852,666.—*Hermann Gahwiler,* Zurich, Switzerland. METHOD AND APPARATUS FOR COMPENSATION OF THE TEMPERATURE-DEPENDENCY OF THE CONDUCTIVITY OF A FLUID WITH SUSPENDED PARTICLES. Patent dated Dec. 3, 1974. Disclaimer filed Dec. 22, 1975, by the assignee, *Contraves AG.*

Hereby, enters this disclaimer to claims 1, 2, 5, and 6 of said patent.

3,855,209.—*Vinton A. Hoyle, Jr.,* Kingsport, Tenn. SYNTHESIS OF INDOLININIUM METHINE DYES. Patent dated Dec. 17, 1974. Disclaimer filed Nov. 7, 1975, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to all claims of said patent.

3,871,822.—*Henry G. Goodman, Jr.,* White Plains, *Carol A. Dupraz,* Flushing (Corona), and *George H. Lourigan,* New City, N.Y. TREATMENT OF CELLULOSIC TEXTILE FABRICS WITH METHYLOLATED ALKOXYALKYL CARBAMATES. Patent dated Mar. 18, 1975. Disclaimer filed July 8, 1975, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 1 to 4 of said patent.

3,876,459.—*Peter Martin Burrill,* Glamorgan, Wales. TREATMENT OF FIBRES. Patent dated Apr. 8, 1975. Disclaimer filed Dec. 8, 1975, by the assignee, *Dow Corning Limited.*

Hereby enters this disclaimer to claims 5 and 6 of said patent.

3,885,070.—*John C. Chapman,* Western Springs, Ill. SELF-ADHESIVE CLOSURE. Patent dated May 20, 1975. Disclaimer filed Nov. 28, 1975, by the assignee, *Avery Products Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,920,340.—*Robert D. Jones* and *Jerry L. Hall,* Oskaloosa, Iowa. CABLE CONNECTOR. Patent dated Nov. 18, 1975. Disclaimer filed Dec. 12, 1975, by the assignee, *Intraco, Inc.*

Hereby enters this disclaimer to claims 1, 2, and 3 of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JANUARY 17, 1976

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	3-19-75
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur: Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	1-2-75
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	1-3-75
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products: Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-10-75
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	2-5-75
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization: General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures: Illumination: Horology; Acoustics; Recorders; Weighing Scales.	12-23-74
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition: Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	3-12-75
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	5-1-75
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-18-75
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	4-10-75[5]
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	9-23-74
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service: Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	3-10-75
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools: Cutlery; Jacks.	4-15-75
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	6-2-75
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-13-75
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	6-25-75

Expiration of patents: The patents within the range of numbers indicated below expire during February 1976, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,871,479 to 2,875,444 inclusive
Plant Patents..... Numbers 1,805 to 1,813 inclusive

PATENT APPLICATIONS

PUBLISHED FEBRUARY 10, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE- A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published applications must be filed in writing before May 10, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

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Box TVPP
Washington, D.C. 20231

Printed copies of the published applications may be purchased from the Patent and Trademark Office at 50 cents each.

An "Index of Applicants and Assignees of Published Applications" and a concordance entitled "Classification of Published Patent Applications" are located in the back of this issue.

GENERAL AND MECHANICAL APPLICATIONS

B 480,350

APPARATUS FOR THE DETERMINATION OF THE THERMAL EFFICIENCY OF CHEMICAL REACTIONS

Willy Regenass, Basel, and Hanspeter Gfrorer, Muttenz, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 18, 1974, Ser. No. 480,350

Claims priority, application Germany, June 25, 1973, 2332135; Nov. 2, 1973, 2354997

Int. Cl.² G01K *17/00*

U.S. Cl. 73—190 R **16 Claims**

References Cited

UNITED STATES PATENTS

3,080,219	3/1963	Harvey, Jr.	23/253
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FOREIGN PATENTS OR APPLICATIONS

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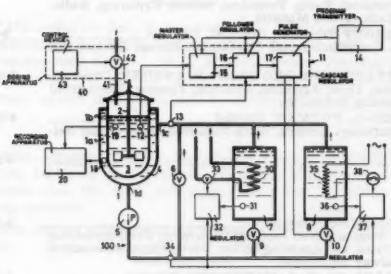
Andersen, "Polymerization Rates by Calorimetry" in Journal of Polymer Science, A-1, Vol. 7, 1969, pp. 2888-2896.



1. In an apparatus for determining the thermal efficiency of a chemical reaction, comprising a reaction vessel equipped with agitation means, a circulation system for a heat transfer fluid medium in communication with said reaction vessel, a heat exchanger for influencing the temperature of the reaction mixture in contact with said reaction vessel and positioned in said circulation system, means positioned in said circulation system for circulating the heat transfer fluid medium, measuring feeler means positioned, respectively, in said reaction vessel and said circulation system for determining the temperature of the reaction mixture and the heat transfer fluid medium, a regulating system cooperatingly connected to said measuring feeler means for controlling the temperature of the reaction mixture, said regulating system including a reference value transmitter for the temperature of the rection mixture and a temperature regulator for opposingly changing the temperature of the heat transfer fluid medium entering the heat exchanger by a multiple of the amount of the reference value deviation from an instantaneous value to establish a set point for the heat transfer fluid, the improvement comprising the reaction vessel being equipped with a double-wall shell constituting said heat exchanger, said shell having inlet and outlet means; the means for circulating the heat transfer fluid medium comprising a circulating mechanism for circulating the heat transfer medium so rapidly that the difference of its temperature at the inlet and at the outlet of said shell over the entire reaction duration, except during possibly occurring momentary unstable points in the reaction kinetics, does not exceed 1°C; the temperature regulator comprising a mixing regulator having a first container for a heat transfer fluid medium which is warmer than the temperature of the heat transfer fluid medium circulating in the circulation system and a second container for a heat transfer medium which is colder than the temperature of the heat transfer fluid medium circulated in the circulation system, means responding to said feeler means and connected to said circulation system for selectively discharging said warmer and colder heat transfer fluid mediums into the circulation system as a function of the reference value deviation of the temperature of the reaction mixture and as a function of the deviation of the temperature of the heat transfer medium from said set point; and means for the continuous determination of the difference between the temperatures of the reaction mixture and the heat transfer fluid medium at a random location of the heat exchanger, said temperature difference being representative of the thermal efficiency to be measured.

B 494,234

METHOD AND APPARATUS FOR APPLYING FLEXOGRAPHIC PRINTING PLATES TO THE PRINTING CYLINDERS OF A MULTI-CYLINDER PRINTING MACHINE

John Maxwell Jackson, Potters Bar, England, assignor to Chromax Ltd., Watford, England

Continuation-in-part of Ser. No. 309,688, Nov. 27, 1972, abandoned. This application Aug. 2, 1974, Ser. No. 494,234

Claims priority, application United Kingdom, Dec. 2, 1971, 55992/71

Int. Cl.² B41L *37/04, 29/06, 29/20*

U.S. Cl. 101—401.3 **8 Claims**

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UNITED STATES PATENTS

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2,711,691	6/1955	Leavens, Jr.	101/DIG. 12
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3,361,060	1/1968	Hoexter et al.	101/216
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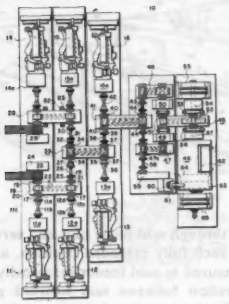

1. A method of mounting flexographic printing plates on the printing cylinders of a multi-cylinder printing machine of the type described, comprising;

stretching one of the flexographic printing plates to a length greater than the length of any of the other printing plates in an unstressed condition, and supporting the plate in the stretched condition on a platform at a precisely predetermined position thereon with the print on the plate facing the platform;

mounting the cylinder at a precisely predetermined position on a rotatable hub having axial and radial abutments engageable with axial and radial abutments on the cylinder, said hub having a precisely predetermined position relative to said platform, the surface of the printing plate facing away from the platform being tangential to the surface of the cylinder;

coating the surface of the cylinder or the last mentioned surface of the printing plate with adhesive;

moving said platform and said hub relative to one another to effect rolling of the cylinder along the stretched printing plate whereby the printing plate adheres to the cylinder at a precisely predetermined position relative to the axial and radial abutments thereon;

removing the cylinder from said hub;

successively stretching each of the other flexographic printing plates to a length precisely equal to that of the first mentioned plate in the stretched condition and on the platform; and

successively repeating said mounting, coating, moving and removing steps with each of said other plates and other cylinders, whereby all the printing plates fitted on cylinders have precisely the same length, and the radial and axial abutments on each cylinder fitted with a plate are in the same spatial relationship relative to the area of the plate corresponding to the total design to be printed, so that the printing media on the plates on the cylinders will be in register with one another for printing purposes when the cylinders are mounted on the printing machine.

B 506,167

ADJUSTABLE WIRE CONTROL MECHANISM

Maurice H. Brown, 11655 S. Mayfield, Worth, Ill. 60482

Filed Sept. 16, 1974, Ser. No. 506,167

Int. Cl.² B65H *49/00, 59/00*

U.S. Cl. 242—129.8 **10 Claims**

References Cited

UNITED STATES PATENTS

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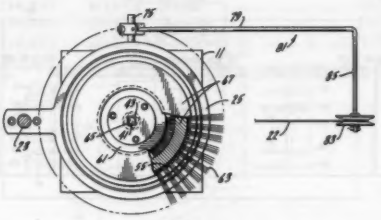

1. A wire tensioning device including

a disc adapted to be mounted on an axial end of a spool of wire,

said disc having a plurality of radially extending resilient filaments that protrude beyond the periphery of the axial end of the spool of wire,

said filaments engaging the wire as it is unwound from the spool over the axial end of the spool to thereby apply a resistance to the uncoiling of said wire, and

means to bend said filaments in the direction of uncoiling of said wire as the uncoiling resistance increases to thereby maintain a relatively constant resistance against the wire during uncoiling.

B 511,407

HELICOPTER TRANSPORTABLE DRILLING RIG

Kenneth Harmon Eddy, and Kenneth Harmon McGill, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 2, 1974, Ser. No. 511,407

Int. Cl.² B66D *1/14*

U.S. Cl. 254—186 R **15 Claims**

References Cited

UNITED STATES PATENTS

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2,613,059	10/1952	Maier	74/661
2,650,065	8/1953	Young	254/187 A
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2,784,557	3/1957	Wilson	74/661
2,936,654	5/1960	Wilson	74/661
3,079,811	3/1963	Isenberg	74/661
3,767,329	10/1973	Houck	417/360

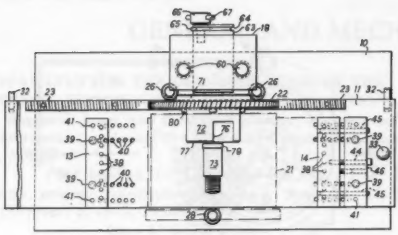
1. A power system for an oil well drilling rig, said system being constructed of integral componets each being portable and having a weight of less than about 4000 pounds, said system comprising:

a plurality of prime movers arranged in close proximity to each other;

means for receiving and mounting each of said prime movers and for transmitting power from said prime movers; said means comprising an integral, portable unit for each said prime mover;

power transfer means interconnectable with said transmitting means and adapted to receive power from at least two of said prime movers via said transmitting means and to transfer said power to an output shaft, said power transfer means comprising a plurality of integral power transfer systems, each system being an integral unit fully transportable without disassembly thereof, and each said system having easily disconnected and reconnected power input and output means;

power accumulator means for receiving the power from all



of said prime movers and having alternately selective dual power outputs;

transmission means connected to said accumulator means and having a high speed transmission connected to one of said accumulator means power outputs, and a low speed transmission connected to the other of said accumulator means power outputs;

main drum drive means releasably connected to both of said transmissions and arranged to selectively receive power from either of said transmissions and transmist power to two output shafts; said main drum drive means being an integral, fully portable unit in itself;

a main drawworks drum connected to one of said output shafts of said main drum drive means in driven relationship therewith; and,

main drum brake means connected to said main drum and arranged to apply braking forces thereto, said brake means comprising an integral brake system disconnectable from said main drum brake means without disassembly of said integral brake system.

B 558,973

SAFETY SUPPORT FOR HARVESTER COMBINE FEEDERS

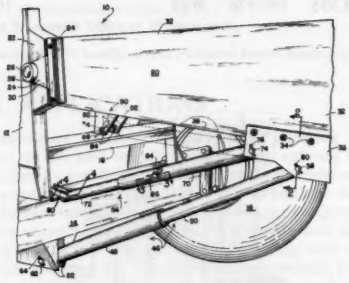
Thomas A. Hocking, Colona, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Mar. 17, 1975, Ser. No. 558,973
Int. Cl.² A01D *41/06*
U.S. Cl. 56—15.9 **11 Claims**

References Cited
UNITED STATES PATENTS

2,949,716	8/1960	Thompson	56/14.3

1. In a harvester combine having a framework including a horizontally disposed transverse axle housing, a crop feeder pivoted at its rear end to the forward end of the combine framework for swinging movements between an operative crop infeed position and a raised inoperative position, and at least one hydraulically operable lift cylinder effective between said framework and feeder for producing such swinging movements, the improvement which compresses an extensible and contractible brace-like safety stand effective in compression between said axle housing and feeder for maintaining the latter in a predetermined elevated position, said safety stand comprising at least one extensible and contractible pair of telescopic inner and outer parts including a forward part effectively pivoted to a forward region of the feeder and a rearward part engageable with said axle housing when said stand is in its fully extended position, a removable pin projecting diametrically through said outer part and serving to maintain the stand in such fully extended position, and a parking bracket fixedly secured to said feeder rearwardly of the point of pivotal connection between said forward part and the feeder and the effective to support the rear end portion of the rear part when said pin is removed and said stand is contracted.



B 572,642

SPEED-CHANGE OPERATING MECHANISM FOR A BICYCLE

Shozo Shimada, Sakai, Japan, assignor to Shimano Industrial Co., Ltd., Osaka, Japan

Filed Apr. 29, 1975, Ser. No. 572,642
Int. Cl.² B62M *25/02*
U.S. Cl. 280—236 **5 Claims**

References Cited
UNITED STATES PATENTS

1,919,531	7/1933	Rosner	188/2 D
3,021,728	2/1962	Shimano	74/750 B

FOREIGN PATENTS OR APPLICATIONS

983,927	6/1951	France	188/24
985,433	7/1951	France	188/24
359,705	6/1938	Italy	188/24

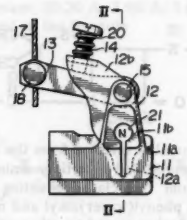
1. A speed-change operating mechanism for a bicycle, which is adapted to be operated with a control wire so as to actuate a push rod which is freely axially movably inserted into a hollow hub shaft at a speed transmission hub, comprising

a. a bracket fixed to said hub shaft,

b. a first operating member pivoted to said bracket and capable of oscillation in relation to said bracket, said first operating member having an axial bore at the middle portion thereof and extending substantially at both sides of said bore to form a control portion and an engageable portion respectively, said control portion being at one

end of said first operating member to reach and come in contact with the foremost end of an extension of said push rod, said engageable portion being at the other end of said first operating member and outwardly extending in a given length,

c. a second operating member pivoted to said bracket and capable of oscillation in relation to said bracket, said second operating member having an axial bore at a base thereof and extending in the direction corresponding to said engageable portion at the first operating member so



as to form a fore end provided with a retainer for fixing one terminal of said control wire therewith, and

d. an adjustor provided between the engageable portion of said first operating member and the middle portion of said second operating member, said adjustor being mounted to one of said operating members for engagement with the other of said operating members, whereby when said control wire is operated the oscillation of said second operating member is conveyed to said first operating member.

B 590,158

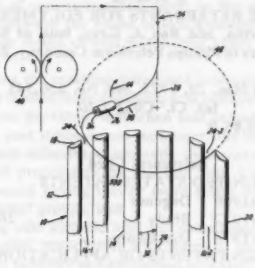
APPARATUS AND METHOD FOR FORMING CIRCULAR DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Ralph A. Vogel, Three Rivers, Mich., and Patrick L. Grawcock, Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation of Ser. No. 473,679, May 28, 1974, abandoned.
This application June 25, 1975, Ser. No. 590,158
Int. Cl.² H02K *15/04*
U.S. Cl. 140—92.1 6 Claims

References Cited
UNITED STATES PATENTS

3,347,474	10/1967	Frank	242/1.1 R
3,514,837	6/1970	Smith	29/205 D
3,579,791	5/1971	Arnold	29/205 D
3,714,973	2/1973	Kieffer et al.	140/92.1
3,791,419	2/1974	Arick et al.	140/92.1



1. Apparatus for placing magnet wire in slots respectively defined by the blades of coil transfer apparatus which lie on an imaginary cylinder in a cylindrical array to form a circular dynamoelectric machine field winding, said apparatus comprising means for guiding said wire toward said blades, means for pushing wire through said guide means without applying tension thereto, and means for moving said guide means relative to said blades in a circular path which overlaps said cylindrical array of blades and which is aligned with the open ends of two or said slots whereby said wire is pushed in a direction away from the center of said path and is also pushed into said two slots.

B 747,785

TRIAMINOGUANIDINE CYANOFORMATE

Milton B. Frankel, Tarzana, Calif., and Lionel A. Dickinson, Indian Head, Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 25, 1968, Ser. No. 747,785
Int. Cl.² C07C *121/42*
U.S. Cl. 260—465.5 R 3 Claims

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OTHER PUBLICATIONS
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Lessing, Scientific American, Vol. 189, No. 1, July 1953, pp. 30–33.

1. $[(NH_2NH)_2C] + [C(CN)_3] -$

B 236,342

FLAME RETARDANTS FOR POLYMERS

Timothy P. Murtha, and Roy A. Gray, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 20, 1972, Ser. No. 236,342
Int. Cl.² C08J *3/20*
U.S. Cl. 260—45.85 R 5 Claims

References Cited
UNITED STATES PATENTS

3,252,922	5/1966	Degener	260/858
3,700,625	10/1972	Brady	260/45.75 R
3,864,306	2/1975	Dieckmann	260/45.75

FOREIGN PATENTS OR APPLICATIONS

915,193	11/1972	Canada

1. A flame-retardant composition comprising 1,11-diacetoxy-6-acetoxymethyl-2,2,6,10,10-penta(bromomethyl)-4,8-dioxaundecane and a synthetic polymer plastic.

B 311,779

PIGMENT FORMULATION

Hans-Heinz Mölls; Karlheinz Wolf, both of Leverkusen; Reinhold Hörnle, Cologne, all of Germany; Gottfried Popp, Charleston, S.C.; Konrad Nonn, Leverkusen, and Jurgen Spille, Schildgen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 4, 1972, Ser. No. 311,779
Claims priority, application Germany, Dec. 4, 1971, 2160208
Int. Cl.² C09C *3/00*
U.S. Cl. 106—309 12 Claims

References Cited
UNITED STATES PATENTS

3,042,540	7/1962	Cabot	106/308
3,252,810	5/1966	Somers	106/309
3,748,164	7/1973	Akamatsu	106/288 Q

1. In the process of comminution of aqueous pigment dispersions or pigment pastes in the presence of a surface active agent; the improvement comprising utilizing as said surface-active agent in an amount of 0.1 to 50% relative to pigment, a surface-active agent which is saponifiable under acidic or alkaline conditions; following comminution, saponifying said surface active agent under acidic or alkaline conditions; and removing saponification products having solubility in water; the resulting pigment being free of surface-active agent.

B 385,024

INTERMEDIATE FOR PRODUCING SEMI-SYNTHETIC PENICILLINS AND CEPHALOSPORINS

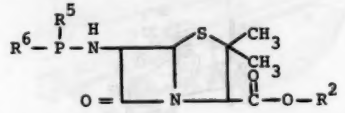
John H. Sellstedt, King of Prussia, Pa., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 197,142, Nov. 9, 1971, Pat. No. 3,859,298.
This application Aug. 2, 1973, Ser. No. 385,024
Int. Cl.² C07D *499/04, 501/02*
U.S. Cl. 260—306.7 C 6 Claims

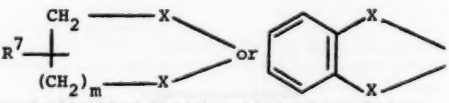
References Cited
UNITED STATES PATENTS

3,809,699	5/1974	Ishimaru	260/306.7

1. A compound having the following formula which is useful as an intermediate for obtaining non-toxic penicillins having antibacterial activity against gram positive and/or gram negative microorganisms:



wherein: R^2 is a member selected from the class consisting of hydrogen, alkali metal and a tertiary amine; R^5 and R^6 are each selected from the class consisting of (lower)alkyl, phenyl, naphthyl, phenyl(lower)alkyl and naphthyl(lower)alkyl; and R^5 and R^6 when joined together with the phosphorus atom form the ring:



wherein: X is selected from the class consisting of oxygen, methylene and sulfur; m is an interger from 1 to 6; R^7 is selected from the class consisting of hydrogen and (lower)alkyl.

B 403,766

TRIAZOLYL STILBENE BRIGHTENERS METHOD OF PREPARING AND DETERGENTS THEREWITH

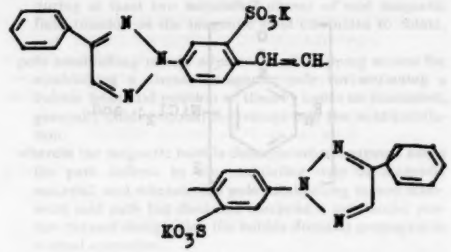
Alfons Dorlars, Leverkusen; Heinrich Gold, Bergisch-Gladbach, and Walter Horstmann, Bergisch-Gladbach, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 5, 1973, Ser. No. 403,766
Claims priority, application Germany, Oct. 5, 1972, 2248820
Int. Cl.² C07D *249/20;* C11D *3/28*
U.S. Cl. 252—543 7 Claims

References Cited
UNITED STATES PATENTS

2,927,866	3/1960	Williams et al.	260/240 C X
3,453,268	7/1969	Dorlars et al.	260/240 C
3,485,831	12/1969	Dorlars et al.	260/240 C
3,578,653	5/1971	Wallace	260/240 C X

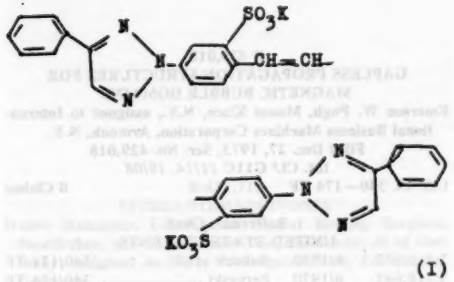
1. The compound of the formula



(I)

in the β-modification, characterised by the following d-values in the X-ray spectrum: 20.20 A; 3.99 A; 3.69 A and 2.91 A.

3. The compound of the formula



(I)

in the γ-modification, characterized by the following d-values in the X-ray spectrum; 19.97 A; 6.45 A; 4.89 A; and 3.60 A.

B 414,266

SULFONATED AROMATIC POLYISOCYANATES AND PREPARATION OF STABLE ANIONIC POLYURETHANE OR POLYUREA LATICES THEREFOR

Robert C. Carlson, Hastings, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 841,570, July 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 749,573, Aug. 2, 1968, abandoned. This application Nov. 9, 1973, Ser. No. 414,266

Int. Cl.² C08J 3/00

U.S. Cl. 260—29.2 TN **13 Claims**

References Cited

UNITED STATES PATENTS

3,178,310	4/1965	Berger et al.	117/142
3,395,129	7/1968	Dieterich et al.	260/77.5
3,479,310	11/1969	Dieterich et al.	260/29.2 TN
3,479,325	11/1969	Blomeyer et al.	260/77.5
3,491,050	1/1970	Heberle et al.	260/29.2 TN
3,617,352	11/1971	Shima et al.	260/29.2 TN
3,759,878	9/1973	Breslow	260/77.5 AT
3,826,769	7/1974	Carlson	260/29.2 TN

FOREIGN PATENTS OR APPLICATIONS

1,078,202	8/1967	United Kingdom	260/77.5
1,076,688	7/1967	United Kingdom	260/29.2 TN

OTHER PUBLICATIONS

Bieber, JACS, 75, 1409–1412, 3–53, "Bieber II".

Degering, Organic Chemistry, 6th Ed., Barnes & Noble, NY, 1957, pp. 206–207.

Saunders et al., Part I, Interscience, NY, 1962, pp. 94 & 95.

1. A method of making a self-emulsified aqueous polyurethane latex comprising

a. reacting an aromatic polyisocyanate with a sulfonating agent, said aromatic polyisocyanate selected from the group consisting of an aromatic diisocyanate monomer having a molecular weight of at least 160, and an isocyanate-terminated prepolymer having a molecular weight of less than about 25,000, and said sulfonating agent selected from the group consisting of H_2SO_4, SO_3, $ClSO_3H$, and mixtures thereof, the number of moles of said sulfonating agent being less than the number of moles of said aromatic polyisocyanate and the ratio of the number of moles of said sulfonating agent to the numerical difference between the moles of said aromatic polyisocyanate and the moles of said sulfonating agent being 0.02:1 to 0.5:1;

b. reacting the resulting sulfonated aromatic polyisocyanate with a base to form a sulfuric acid salt-substituted polyisocyanate; provided, that when said aromatic diisocyanate is the said diisocyanate monomer, the resulting sulfonic acid salt-substituted aromatic diisocyanate is converted to said prepolymer by reaction with a polyoxyalkylene compound having two or more active hydrogen-bearing functional groups; and

c. mixing said sulfonic acid salt-substituted aromatic polyisocyanate prepolymer with water to obtain a chain extended polymer self-emulsified in water.

B 415,122

POLYMER COMPOSITION

Terence John Henman, Haslingfield, and Graham Williams, Hitchin, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 12, 1973, Ser. No. 415,122

Claims priority, application United Kingdom, Nov. 27, 1972, 54674/72

Int. Cl.² C08K 3/30, 7/14

U.S. Cl. 260—42.15 **11 Claims**

References Cited

UNITED STATES PATENTS

3,579,476	5/1971	Rieke et al.	260/42.18

FOREIGN PATENTS OR APPLICATIONS

1,095,700	12/1967	United Kingdom
1,174,943	12/1969	United Kingdom

1. A polymeric composition comprising a blend of (a) a graft copolymer obtained by grafting an unsaturated dicarboxylic acid or the anhydride thereof onto a propylene polymer wherein the grafted acid or anhydride is present in an amount sufficient to give an acid moiety which is at least equivalent to that provided by 0.01 percent by weight of maleic anhydride,

and (b) at least one acid selected from the group consisting of sulphur-containing acids of the formula

RSO_nH

wherein 1–90 percent by weight of the acid moieties of the blend of (a) and (b) are present in the acid and/or anhydride component of the graft copolymer; and

R is NR'''_2, a hydrocarbyl group, or a substituted hydrocarbyl group, and when the group is an aromatic group, any substituent containing an atom other than carbon, hydrogen or oxygen is located in a position which is other than meta- to the $-SO_nH$ group;

R''' is hydrogen or a hydrocarbyl group; and *n* is 2 or 3.

B 428,103

DIMERIZATION OF MONOOLEFINS WITH CATALYSTS ON SOLID SUPPORTS

Clifford E. Smith; Edward L. Czenkusch, and Grant C. Bailey, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 872,409, Oct. 29, 1969, abandoned. This application Dec. 26, 1973, Ser. No. 428,103

Int. Cl.² C07C *3/21*

U.S. Cl. 260—683.15 D **16 Claims**

References Cited

UNITED STATES PATENTS

3,482,001	12/1969	Eberhardt	260/683.15 D
3,483,269	12/1969	Magoon et al.	260/683.15 D
3,591,656	7/1971	Kroll	260/683.9
3,592,869	7/1971	Cannell	260/683.15 D
3,709,953	1/1973	Bergem et al.	260/683.15 D
3,755,490	8/1973	Yoo et al.	260/683.15 D

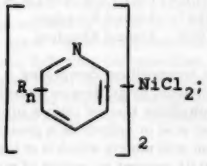
FOREIGN PATENTS OR APPLICATIONS

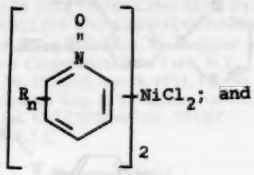
711,042	8/1968	Belgium

1. A process for dimerizing at least one monoolefin selected from the group consisting of ethylene and propylene which comprises contacting said monoolefin with a catalyst under suitable reaction conditions, said catalyst having been prepared by:

A. heat treating a solid catalyst support consisting essentially of silica, silica-alumina, or mixtures thereof, with flowing air at a temperature in te range of 800° to 1500°F. for a time in the range of 0.1 to 24 hours, said solid catalyst support being characterized by a pH value of less than 6 when slurried with distilled and decarbonated water, and

B. contacting the thus heat treated solid catalyst support with (a) a nickel complex selected from the group consisting of compounds having the formula





$(R_3P)_2NiCl_2$, wherein each R is individually selected from alkyl radicals having up to 20 carbon atoms; and *n* is zero or an integer in the range of 1 to 5; and (b) an aluminum compound having the formula R_xAlCl_y, wherein R is as previously defined, and *x* and *y* are integers in the range of 0 to 3 with the sum of *x* and *y* being 3.

B 429,018

GAPLESS PROPAGATION STRUCTURES FOR MAGNETIC BUBBLE DOMAINS

Emerson W. Pugh, Mount Kisco, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1973, Ser. No. 429,018

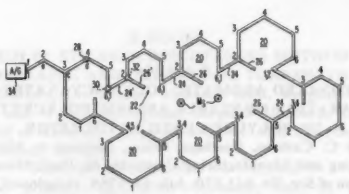
Int. Cl.² G11C *11/14, 19/08*

U.S. Cl. 340—174 TF **8 Claims**

References Cited

UNITED STATES PATENTS

3,516,077	6/1970	Bobeck et al.	340/174 TF
3,518,643	6/1970	Perneski	340/174 TF
3,534,346	10/1970	Bobeck	340/174 TF
3,534,347	10/1970	Bobeck	340/174 TF
3,644,908	2/1972	Bobeck	340/174 TF
3,689,901	9/1972	Bobeck	340/174 TF
3,778,788	12/1973	Bobeck et al.	340/174 TF
3,815,107	6/1974	Almasi	340/174 TF
3,828,329	8/1974	Fischer et al.	340/174 TF



1. A gapless, single-sided propagation structure for implementing the continuous, generally unidirectional movement of magnetic bubble domains in a supporting material in response to an externally applied, in-plane magnetic field rotating in a constant circular direction through a plurality of phases, comprising:

a generally undulating, non-self-crossing strip of magnetic material having in-plane magnetization,

trapping means associated with each undulation at a discrete predetermined position thereon for momentarily holding a bubble substantially stationary at said position

during at least two sequential phases of said magnetic field rotation as the magentic field continues to rotate, and

pole establishing means adjacent each trapping means for establishing a discrete magnetic pole for attracting a bubble from said position to thereby cause its continued, generally unidirectional movement into the next undulation,

wherein the magnetic bubble domains are propagated along the path defined by the undulating strip of magnetic material, and wherein the pole establishing means intersects said path but does not comprise a substantial portion thereof along which the bubble domains propagate in normal operation.

B 431,713

NITROANTHRAQUINONES

Walter Hohmann, Leverkusen; Helmut Herzog, Bergisch-Neukirchen, and Hans-Samuel Bien, Burscheid, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 8, 1974, Ser. No. 431,713

Claims priority, application Germany, Jan. 8, 1973, 2300592

Int. Cl.² C09B 1/16

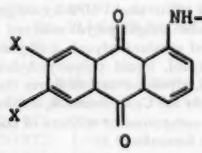
U.S. Cl. 260—378 **5 Claims**

References Cited

UNITED STATES PATENTS

1,828,588	10/1931	Bally et al.	260/378
2,273,966	2/1942	Klein	260/378
2,727,045	12/1955	McSheehy	260/378
2,759,940	8/1956	Bucheler et al.	260/378 X
3,123,605	3/1964	Turetzky et al.	260/378 X
3,491,126	1/1970	Schwander et al.	260/378 X
R27,413	6/1972	Schwander et al.	260/378 X

1. Compound or mixtures of compounds having the formula



in which

one X is a nitro and the other X is hydrogen; and R is C_1–C_{12}-alkyl; phenyl-C_1–C_8-alkyl; phenyl-C_1–C_{12}-alkyl; phenyl-C_1–C_{12}-alkyl substituted in the phenyl ring by C_1–C_4-alkyl; cyclohexyl; or cyclohexyl substituted by benzyl, phenyl or cyclohexyl.

B 440,633

PROCESS FOR THE MANUFACTURE OF POLYETHERS CONTAINING IONIC BONDS

Alfred Renner, Munchenstein, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 7, 1974, Ser. No. 440,633

Claims priority, application Switzerland, Feb. 14, 1973, 2086/73

Int. Cl.² C08G 30/14

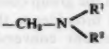
U.S. Cl. 260—47 EP **25 Claims**

References Cited

UNITED STATES PATENTS

3,436,373	4/1969	Cox et al.	260/47 X
3,462,382	8/1969	Kolka	260/51.5 X
3,625,684	12/1971	Poot et al.	260/2 X
3,790,606	2/1974	Sellet	260/51.5 X

1. A process for the manufacture of crosslinked macromolecular polyethers containing ionic bonds, wherein polyhydric mononuclear or polynuclear phenols (A) which possess, as substituents in the o- or p-positions to the OH groups, a total of at least 2 radicals of the formula I



(I)

in which R^1 and R^2 are identical or different and denote a saturated or unsaturated hydrocarbon radical with 1 to 4 carbon atoms or together denote the morpholino radical (such phenols being Mannich bases), are reacted with compounds (B) which contain at least one Cl or Br or I atom bonded to a hydrocarbon radical and at least one 1,2-epoxide group, with addition of the 1,2-epoxide groups to the phenol groups and with quaternization of the halogenated hydrocarbon radicals with the radicals of the formula I, and optionally with organic compounds (C) which contain at least one Cl or Br or I atom bonded to a hydrocarbon radical, with quaternizaton of the halogenated hydrocarbon radicals with the radicals of the formula I, optionally in the presence of water or organic solvents at temperatures of 20° to 200°C.

B 450,196

COATED POLYESTER FILMS

Cyril John Ealding, Puckeridge, and Gordon Edmund Alfred Pears, Harpenden, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Mar. 11, 1974, Ser. No. 450,196

Claims priority, application United Kingdom, Apr. 2, 1973, 15704/73; July 16, 1973, 33715/73

Int. Cl.² B32B 27/06, 27/36

U.S. Cl. 428—341 **4 Claims**

References Cited

UNITED STATES PATENTS

3,437,484	4/1969	Nadeau	117/138.8 X
3,598,641	8/1971	Miller et al.	117/138.8 E
3,819,773	6/1974	Pears	264/37

1. An antistatic polyester film coated on one side with an antistatic layer comprising lithium nitrate and an acrylic or methacrylic polymer or copolymer binder wherein the coat weight of lithium nitrate is at least 100 $\mu g/dm^2$.

B 456,579
PROCESS FOR FORMING FIRE RETARDANT POLYMERS OF BIS (HYDROCARBYL) VINYLPHOSPHONATE

Jesse C. H. Hwa, Stamford, Conn., and Paul Kraft, Spring Valley, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Apr. 1, 1974, Ser. No. 456,579
Int. Cl.² C08L *27/06, 27/08, 27/10*
U.S. Cl. 260—884 **15 Claims**

References Cited
UNITED STATES PATENTS

3,583,956	6/1971	Pointer et al.	204/159.17
3,691,127	9/1972	Kraft et al.	260/884
3,726,839	4/1973	Jin	260/884
3,798,287	3/1974	Murayama et al.	260/878 R
3,800,007	3/1974	Bafford	260/877

1. In a process for forming a polymer of a bis(hydrocarbyl) vinylphosphonate comprising the steps of forming a polymerization medium containing a bis(hydrocarbyl) vinyl phosphonate monomer and polymerizing said monomer, wherein the improvement comprises adding a monoethylenically unsaturated monomer selected from the group consisting of the vinyl and vinylidene chlorides and bromides to the polymerization medium only when the percent conversion of monomer therein is 40% or greater and residual unreacted vinylphosphonate monomer remains.

B 457,850
WATER-SOLUBLE COMPLEX OF CUPROUS CHLORIDE, HYDROCHLORIC ACID AND AT LEAST ONE AMINE OR AMINE SALT

Ferdinand Hagedorn; Karlfried Wedemeyer, and Rodulf Mayer-Mader, all of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 4, 1974, Ser. No. 457,850
Claims priority, application Germany, Apr. 11, 1973, 2318115
Int. Cl.² B01J *31/30*
U.S. Cl. 252—429 R **6 Claims**

References Cited
UNITED STATES PATENTS

2,328,275	8/1943	Heard	260/663
2,503,264	4/1950	Hampton	252/429 R X
3,078,283	2/1963	Hay	252/429 R X
3,388,176	6/1968	Sheard	252/429 R X
3,651,019	3/1972	Asscher et al.	260/77.2
3,819,730	6/1974	Nakata et al.	252/429 R X

1. A composition consisting essentially of the aqueous phase reaction product of:
I. cuprous chloride,
II. hydrochloric acid and
III. at least one amine or amine salt having an atomic ratio of carbon to nitrogen less than 14 and being either
a. a pyridine having 1 to 3 alkyl groups as carbon atom substituents thereof,
b. an N,N-dialkylaniline or said aniline having the aromatic nucleus thereof substituted with one or two methyl groups,
c. diethylamine,
d. triethylamine or
e. a hydrochloride of one of the amines of *a* to *d*, reactants I–III for forming said composition being present in amounts producing a water-soluble complex useful as a catalyst for the addition of hydrogen chloride to chloroprene for preparing 1,3-dichlorobutene-(2) in the liquid phase.

B 468,052
1-SUBSTITUTED-6-(2-SUBSTITUTED AMINOETHOXY)XANTHEN-9-ONES

Arthur A. Santilli, Havertown; Anthony C. Scotese, King of Prussia; Stanley C. Bell, Penn Valley, and Marvin E. Rosenthale, Havertown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed May 8, 1974, Ser. No. 468,052
Int. Cl.² C07D *405/12*
U.S. Cl. 260—247.7 T **4 Claims**

References Cited
UNITED STATES PATENTS

3,555,043	1/1971	Archer	260/335
3,597,420	8/1971	Archer	260/335

FOREIGN PATENTS OR APPLICATIONS

776,555	4/1972	Belgium	260/335

1. 1-Hydroxy-6-(2-morpholinoethoxy)xanthen-9-one.

B 471,405
MIXTURES OF HIGH AND LOW MOLECULAR WEIGHT POLYOLS RESISTANT TO PHASE SEPARATION

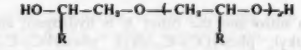
Benny Gene Barron, 110 Oyster Bend Lane, Lake Jackson, Tex. 77566, assignor to The Dow Chemical Company, Midland, Mich.

Filed May 20, 1974, Ser. No. 471,405
Int. Cl.² C08G *18/65*
U.S. Cl. 252—182 **13 Claims**

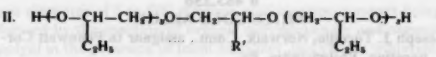
References Cited
UNITED STATES PATENTS

3,630,973	12/1971	Ardis et al.	260/2.5 AM X

1. A composition resistant to phase separation which comprises:
A. an insoluble mixture which is susceptible to phase separation which comprises:
1. from about 95% to about 50% by weight of a relatively high molecular weight polyoxy alkylene polyol wherein the majority of the polyoxyalkylene groups are other than oxyethylene groups and have an average of from about 2 to about 4 OH groups per molecule an an average OH equivalent weight of from about 650 to about 3000 or mixtures thereof, and
2. from about 5% to about 50% by weight of a relatively low molecular weight polyol selected from the group consisting of ethylene glycol, diethylene glycol, tetraethylene glycol, liquid polyoxyethylene glycols, 1,4-butane diol, glycerine and mixtures thereof; and
B. as a solubilizer for Component A, a minor but effective quantity of a compound or mixture of compounds represented by the formulas

I. 

wherein R is methyl or ethyl and *x* has a value from 0 to about 3 with the proviso that when *x* is O, R is ethyl;

II. 

wherein R′ is hydrogen or methyl, y and z independently have a value from zero to about 2 with the proviso that at least one of y and z must have a value of at least 1.

B 471,617

PROCESS FOR THE MANUFACTURE OF PEPTIDES CONTAINING CYSTINE

Bruno Kamber, Basel; Peter Sieber, Reinach; Bernhard Riniker, Frenkendorf, all of Switzerland; Albert Hartmann, Grenzach, Germany, and Werner Rittel, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1974, Ser. No. 471,617

Claims priority, application Switzerland, May 24, 1973, 7526/73; Sept. 14, 1973, 13274/73

Int. Cl.² C07C *103/52*; A61K *37/26*; C07G *7/00*

U.S. Cl. 260—112.5 R **15 Claims**

References Cited

OTHER PUBLICATIONS

Hermann et al.: Chem. Abstr. 78: 136,656m, (1973).
Kamber: Chem. Abstr. 78: 124,894z, (1973).
Moroder et al.: Chem. Abstr. 78: 160,089z, (1973).

1. In a process for the manufacture of peptides containing more than one disulphide bond from peptides containing cysteine radicals and in which one or two cysteine radicals which are to be linked are protected by a mercapto-protective group R_1, which is an aralkyl radical containing at least two cyclic residues, whose aliphatic part, which is bonded to the sulphur of the mercapto group, is lower alkyl or cycloalkyl with at most 7 carbon atoms and whose arylic part is at least one phenyl group which is unsubstituted or substituted by one or more members of the group consisting of lower alkyl, lower alkoxy and halogen, and two other cysteine radicals which are to be linked are protected by an acylaminomethyl group R_2, of the formula $-CH_2-NH-COR$, wherein $-COR$ represents the acyl radical of a carboxylic acid, the improvement which comprises removing the protective group R_1 by reacting the peptide with iodine in the presence of polyhalogenated lower alkanol or a polyhalogenated di-lower alkyl ketone, at the same time forming the disulphide bond between the cysteine radicals which were protected by R_1 and forming the second disulphide bridge after removal of the polyhalogenated compound.

B 473,039

CRYSTALLINE SESQUIHYDRATE OF 7-[D-α-AMINO-α-(P-HYDROXYPHENYL)ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID

Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,039

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **1 Claim**

References Cited

UNITED STATES PATENTS

3,641,021	2/1972	Ryan	260/243 C
3,674,776	7/1972	Long et al.	260/243 C
3,759,904	9/1973	Crast	260/243 C
3,855,213	12/1974	Dunn et al.	260/243 C

1. Crystalline 7-[D-α-amino-α-(p-hydroxyphenyl)-acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid sesquihydrate exhibiting essentially the following X-ray powder diffraction properties:

Line	Spacing (A)	Relative Intensity
1	9.31	45
2	6.77	93
3	6.17	32
4	5.56	14
5	4.42	100
6	3.97	76
7	3.78	95
8	3.55	55
9	3.41	53
10	3.10	26
11	3.01	19
12	2.94	9
13	2.83	17
14	2.77	23
15	2.55	19
16	2.32	10
17	2.23	12
18	2.05	10
19	1.97	6
20	1.88	7.

B 473,040

7-(D-α-HYDROXY-2-ARYLACETAMIDO)-3-(TETRAZOLO-[4,5-b]PYRIDAZIN-6-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACIDS

Takayuki Naito, Tokyo; Jun Okumura, and Hajime Kamachi, both of Yokohama, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 24, 1974, Ser. No. 473,040

Int. Cl.² C07D *501/20*

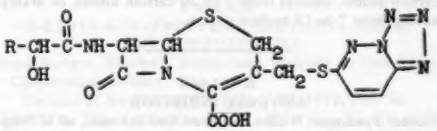
U.S. Cl. 260—243 C **54 Claims**

References Cited

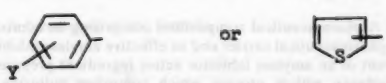
UNITED STATES PATENTS

3,814,755	6/1974	Naito et al.	260/243 C
3,855,213	12/1974	Dunn et al.	260/243 C

1. An acid having the D configuration in the 7-sidechain and the formula



wherein R is



and Y is hydrogen, chlorine, bromine, fluorine, trifluoromethyl, amino, nitro, hydroxy, lower alkyl of 1–4 carbon atoms or lower alkoxy of 1–4 carbon atoms.

B 480,452

4-(3,5-DIALKYL-4-HYDROXYPHENYL)-1,2-DITHIOLE-3-THIONES

John Grey Dingwall, Brooklands Sale; Peter Miles, and Donald Richard Randell, both of Stockport, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 18, 1974, Ser. No. 480,452
Claims priority, application United Kingdom, June 20, 1973, 29334/73
Int. Cl.² C07D *339/04*
U.S. Cl. 260—327 C 26 Claims

References Cited
UNITED STATES PATENTS

2,653,910	9/1953	Airs et al.	252/45

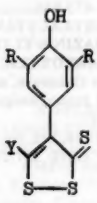
FOREIGN PATENTS OR APPLICATIONS

808,064	1/1959	United Kingdom	252/45

OTHER PUBLICATIONS

Voronkov, et al., Chem. Abst. 73:77104b (1970).
Reid, Org. Chem. of Bivalent Sulfur, Vol. II (1960, Chem. Pub. Co., N. Y.) p. 26.

1. A compound of the formula



(I)

in which R and R¹ are the same or different and each is an alkyl radical having from 1 to 12 carbon atoms, a cycloalkyl radical having from 5 to 12 carbon atoms which may be substituted with alkyl groups having from 1 to 4 carbon atoms or an aralkyl radical having from 7 to 14 carbon atoms, and Y is hydrogen, mercapto or SR² where R² is an alkyl radical having from 1 to 20 carbon atoms, cycloalkyl having from 5 to 12 carbon atoms, alkenyl from 3 to 20 carbon atoms, or aralkyl having from 7 to 14 carbon atoms.

B 482,660

AMYLASE INHIBITOR

Werner Frommer; Walter Puls, and Delf Schmidt, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 336,687, Feb. 28, 1973, Pat. No. 3,855,066. This application June 24, 1974, Ser. No. 482,660
Claims priority, application Germany, Mar. 1, 1972, 2209833
Int. Cl.² A61K *35/00*
U.S. Cl. 424—115 1 Claim

1. A pharmaceutical composition comprising an admixture of a pharmaceutical carrier and an effective amylase inhibiting amount of an amylase inhibitor active ingredient prepared in accordance with a process which comprises culturing the microorganism Actinoplanaceae CBS 614.71 in a nutrient medium until a sufficient quantity of amylase inhibitor has been produced, and recovering the said amylase inhibitor from the resultant culture.

B 483,256

WHITE GOLD ALLOY

Joseph J. Tuccillo, Norwalk, Conn., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 370,496, June 15, 1973, abandoned, Continuation-in-part of Ser. No. 190,686, Oct. 19, 1971, abandoned. This application June 26, 1974, Ser. No. 483,256
Int. Cl.² C22C *5/02*
U.S. Cl. 75—165 9 Claims

References Cited
UNITED STATES PATENTS

1,283,264	10/1918	Mowrey	75/165
1,296,938	3/1919	Fahrenwald	75/165
1,987,451	1/1935	Taylor	75/165 X
2,980,998	4/1961	Coleman et al.	32/12
3,413,723	12/1968	Wagner et al.	32/8
3,667,936	6/1972	Katz	75/134 N
3,679,402	7/1972	Hirschhorn	75/165
3,767,391	10/1973	Tuccillo	75/134 C

1. A white gold alloy for dental castings which is characterized by having, after heat treatment by heating to 1900°F. at a rate of 75° to 100°F. per minute and maintaining at 1900°F. for about 10 minutes and cooling, an ultimate tensile strength of at least about 90,000 psi., a yield strength of at least about 70,000 psi., and a Brinell hardness number of at least about 170, consisting essentially, in percent by weight, of 50 to 54% gold; 27 to 31% palladium; 11 to 16% silver; about 0.05 to about 0.25% of iridium or ruthenium, and a total of 4.5 to 8% of indium and tin, provided there is at least 2% indium and no more than 4.5% tin, and further provided that if there is less than about 6% indium, there must be at least 0.25% tin.

B 483,762

POLY(URETHANE-ISOCYANURATE) FOAMS CONTAINING HOLLOW GLASS SPHERES

James N. Wells, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

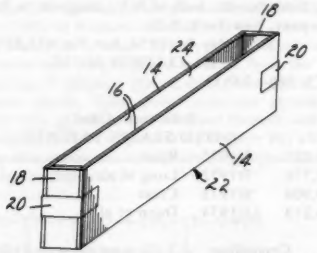
Filed June 27, 1974, Ser. No. 483,762
Int. Cl.² C08G *18/14*; B32B *27/40*; C09K *3/00*
U.S. Cl. 260—2.5 AW 12 Claims

References Cited
UNITED STATES PATENTS

3,365,315	1/1968	Beck et al.	260/2.5 AK
3,510,392	5/1970	D'Eustachio et al.	260/2.5 AK
3,524,794	8/1970	Jonnes et al.	260/2.5 AK
3,585,157	6/1971	Beck	260/2.5 AK
3,644,168	2/1972	Bonk et al.	260/2.5 AW
3,801,421	4/1974	Allen et al.	260/2.5 AW
3,814,659	6/1974	Nadeau	260/2.5 AW

FOREIGN PATENTS OR APPLICATIONS

843,841	8/1960	United Kingdom	260/2.5 AW
1,223,415	2/1971	United Kingdom	260/2.5 AW
2,034,171	1/1971	Germany	260/2.5 AW



1. A poly(urethane-isocyanurate) foam comprising a continuous matrix of a reaction product and, within said matrix, a discontinuous phase of hollow glass spheres having an aver-

age diameter of 5 to 500 microns, said reaction product being formed by the reaction of organic polyisocyanate and organic polyol in the presence of foam stabilizer, isocyanate trimerization catalyst and blowing agent, the NCO/OH equivalent ratio being 1.2/1 to 2.5/1, and the average molecular weight of the polyol being in the range of 600 to 1500, said foam stabilizer comprising a fluorochemical having the formula $(R_f)_mQ_z(H)_n$ wherein R_f is a fluorinated, monovalent, aliphatic radical, H is an active hydrogen atom, Q is a linkage free of active hydrogen atoms having a valence equal to $m+n$, m is an integer of at least 1, n is an integer of at least 2, and z is an integer of from 1 to 3, said polymeric reaction product having isocyanate-derived linkages consisting essentially of isocyanurate and urethane linkages; wherein the crosslink density of said reaction product is in the range of about one crosslink per 400 to 800 atomic weight units; wherein said glass spheres are 2 to 20 percent by volume of said foam; and wherein said foam has a density in the range of 10 to 20 pounds per cubic foot; and wherein said foam exhibits a beam flexural modulus at least as great as that calculated from the formula $\text{Log}_{10}F=(0.05229)-D+4.9542$ wherein F is the beam flexural modulus in pounds per square inch and D is the density of the foam in pounds per cubic foot.

B 484,269

PREPARATION OF N,N-DISUBSTITUTED THIOAMIDES

Lacey E. Scoggins, and Donald H. Kubicek, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 28, 1974, Ser. No. 484,269
Int. Cl.² C07C *153/057;* **C07D** *207/26*
U.S. Cl. 260—326.5 FN **8 Claims**

References Cited
UNITED STATES PATENTS

2,368,515	1/1945	Blake	260/551 S UX
2,531,283	11/1950	Levesque	260/551 S
2,539,325	1/1951	Prochazka	260/239.3 R
2,560,296	7/1951	Levesque	260/551 S
3,192,210	6/1965	Lansford et al.	260/326.45 X

OTHER PUBLICATIONS
Hurd et al., Chem. Rev. 61, 45, (1961), pp. 46–49.

1. A method for preparing N,N-disubstituted thioamides consisting essentially of contacting at an elevated temperature in a range of 200°C to 350°C a sulfide selected from carbon disulfide or carbon oxysulfide with an N,N-disubstituted amide represented by the formula

wherein each R is a hydrocarbyl radical selected from alkyl, cycloalkyl, aryl, and combinations thereof such as alkaryl, aralkyl, and the like, the number of carbon atoms in each R being within the range 1 to about 20, R′ is selected from R and hydrogen, and the total number of carbon atoms in each of said amide or thioamide is within the range of 3 to about 30, with the proviso that R′ and one R together can be $-(CR''_2)_n-$, wherein R″ is selected from hydrogen, alkyl, cycloalkyl, and aryl, and combinations thereof such as alkaryl, aralkyl, and the like, n is an integer of 2 to about 12, and the total number of carbon atoms in $-(CR''_2)_n-$ is within the range of 2 to about 20, to produce a thioamide product represented by the formula

wherein R, R′, and R″ are the same as described above.

B 491,032

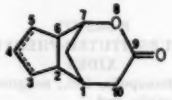
POLYCYCLIC LACTONES AS ODOUR- AND TASTE-MODIFYING AGENTS

Werner Skorianetz, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Filed July 23, 1974, Ser. No. 491,032
Claims priority, application Switzerland, Aug. 1, 1973, 11267/73
Int. Cl.² C07D *493/00*
U.S. Cl. 260—343.2 R **4 Claims**

References Cited
OTHER PUBLICATIONS
House Modern Synthetic Reactions, 2nd Ed. (1972), pp. 321–327.

1. A tricyclic lactone of formula



I

wherein one of the rings contains a single or a double bond in one of the positions indicated by the dotted lines.

B 496,430

O-ETHYL-S-(N)-PROPYL-S-CARBAMOYLALKYL DITHIOPHOSPHATES

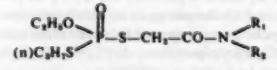
Ernst Beriger, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 315,973, Dec. 18, 1972, Pat. No. 3,845,171. This application Aug. 9, 1974, Ser. No. 496,430
Claims priority, application Switzerland, Dec. 24, 1971, 18909/71; Nov. 3, 1972, 16041/72
Int. Cl.² C07C *9/165;* **A01N** *9/36*
U.S. Cl. 260—940 **3 Claims**

References Cited
UNITED STATES PATENTS

3,033,744	5/1962	Losco et al.	260/940 X

1. A compound of the formula



wherein R_1 represents hydrogen or methyl and R_2 represents $-CH_2CN$, $-C_2H_4CN$.

B 498,205

RADIATION TREATMENT OF POLYMERS CONTAINING ISOBUTYLENE

Anton Shurpik, Hauppauge, N.Y., assignor to The Firestone Tire & Rubber Co., Akron, Ohio

Division of Ser. No. 321,814, Jan. 8, 1973. This application Aug. 16, 1974, Ser. No. 498,205

Int. Cl.[2] C08F 2/46; C08K 5/02

U.S. Cl. 204—159.18 **5 Claims**

References Cited

UNITED STATES PATENTS

2,814,609	11/1957	Borunsky	204/159.18
2,945,792	7/1960	Miller	204/159.18
2,962,479	11/1960	Aldridge et al.	260/85.3 C
3,737,421	6/1973	Halasa	260/85.3 C

OTHER PUBLICATIONS

Turner, D. T., Radiation Crosslinking of Rubber–Effect of Additives Journal of Polymer Science, Vol. XXVII, pp. 503–514 (1958).

1. A process which comprises subjecting compositions containing polymers of isobutylene and copolymers thereof with isoprene, the isoprene content of the copolymers being from 0.6 to 3 mole percent, the average molecular weight of the polymers and copolymers being from 225,000 to 6,000,000 together with from about 1 to 10 percent by weight based on the total weight of polymer or copolymer of a halogenated hydrocarbon radiation catalyst to high energy ionizing radiation at a total dose of from 0.5 to 15 megarads.

B 503,579

3,3-DIALKYL-1-(SUBSTITUTED-PHENYL) TRIAZENE-1-XIDES

John L. Miesel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sept. 6, 1974, Ser. No. 503,579

Int. Cl.[2] C07C 107/04

U.S. Cl. 260—140 R **12 Claims**

References Cited

UNITED STATES PATENTS

3,138,521	6/1964	Jelinek et al.	260/140 X
3,206,357	9/1965	Cannon et al.	260/140 X
3,714,351	1/1973	Gubler	424/226

FOREIGN PATENTS OR APPLICATIONS

1,130,469	10/1968	United Kingdom	260/140
2,147,259	3/1972	Germany	424/226
791,322	5/1973	Belgium	260/140

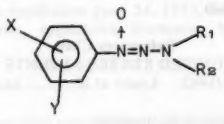
OTHER PUBLICATIONS

Behera et al., Spectrochim. Acta, Part A, 1971, 27(10), pp. 2273–2275.

Chakrauorty et al., Chemical Abstracts, Vol. 75 (1971).

Behera et al., Chemical Abstracts, Vol. 75 (1971).

1. A compound of the formula:



wherein R_1 and R_2 taken separately are C_1-C_3 alkyl or R_1 and R_2 taken together with the nitrogen to which they are attached form a heterocyclic group selected from the class consisting of piperidino, C_1-C_3 alkylpiperidino, di-(C_1-C_3 alkyl)piperidino, morpholino, and 3-(2-oxo-oxazolidino);

X is hydrogen, halo, nitro, C_1-C_3 lower alkoxy, C_1-C_3 lower dialkylamino, trifluoromethyl or C_1-C_3 lower alkyl, and Y is hydrogen, C_1-C_3 lower alkyl, halo or C_1-C_3 lower alkoxy.

B 505,126

REGENERATIVE FUEL CELL

James K. Stedman, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 11, 1974, Ser. No. 505,126

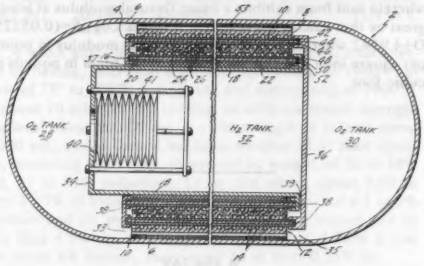
Int. Cl.[2] H01M 33/00

U.S. Cl. 136—86 R **1 Claim**

References Cited

UNITED STATES PATENTS

3,489,670	1/1970	Maget	204/129
3,839,091	10/1974	Bloomfield et al.	136/86 R



1. A regenerative fuel cell system which operates on hydrogen and oxygen, comprising:

a housing;

a first assembly disposed in said housing including a fuel cell having a hydrogen electrode, a first oxygen electrode and an electrolyte matrix disposed therebetween, and including a first oxygen passage in fluid communication with said first oxygen electrode, said first oxygen electrode being composed of a first material;

a second assembly disposed in said housing including an electrolysis cell having a hydrogen electrode, a second oxygen electrode and an electrolyte matrix disposed therebetween, and including a second oxygen passage in fluid communication with said second oxygen electrode, said second oxygen electrode being composed of a second material different from said first material, said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode being spaced apart and in facing relationship;

a water matrix disposed in the space between and in contact with said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode and including portions bridging said hydrogen electrodes for transporting water produced by said fuel cell during fuel cell operation to said electrolysis cell for use during electrolysis cell operation, said water matrix shaped to define hydrogen passages in communication with said fuel cell hydrogen electrode and said electrolysis cell hydrogen electrode, said first assembly having a water storage matrix associated with one of said fuel cell electrodes for storing water produced by said fuel cell during fuel cell operation, said water storage matrix being adjacent said first oxygen electrode of said fuel cell and in fluid communication with said water matrix;

fluid connecting means in communication with said hydrogen passages and said oxygen passages for providing hydrogen to said hydrogen passages and oxygen to said oxygen passages, and including seal means preventing said hydrogen passages from communicating with said oxygen passages; and

means for operating said first assembly always as a fuel cell and said second assembly always as an electrolysis cell, said means being in electrical communication with said assemblies.

B 506,144

PROCESS FOR MOLDING FOAMED PLASTICS FROM REACTION MIXTURES INVOLVING CLOSED MOLD FILLING WITH THE AVOIDANCE OF GAS BUBBLE ENTRAINMENT

Ulrich Knipp, Schildgen-Nittum, and Heinrich Boden, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 16, 1974, Ser. No. 506,144

Claims priority, application Germany, Sept. 27, 1973, 2348658

Int. Cl.² B29D *27/00*

U.S. Cl. 264—51 **6 Claims**

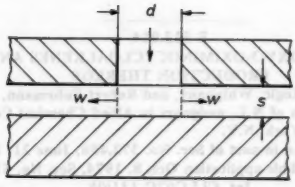
References Cited

UNITED STATES PATENTS

3,660,548	5/1972	Komada et al.	264/54 X
3,745,203	7/1973	Harper	264/DIG. 83
3,846,524	11/1924	Elmore et al.	161/161 X

OTHER PUBLICATIONS

Mobay Bulletins, "The Rolling Showcase For Engineering Plastics," Pittsburgh, Pa., Mobay Chemical Co., (1968), pp. 1–8.



1. A process for filling molds with reaction mixtures having viscosities in the range from 100 cP to 2500 cP, the reaction mixture flowing through a feed passage into a closed mold cavity onto that wall of the mold opposite the feed opening and being distributed around the mold cavity by flowing radially downwards, wherein the wall thickness s of the molding in the vicinity of the inlet opening and at the point in time at which the mixture is introduced amounts to between 0.5 and 15 mm, this wall thickness s in mm, the radial distribution rate w_{radial} of the reaction mixture in m/second between the feed opening and the opposite wall of the mold and the viscosity η of the reaction mixture in cP satisfying the following relation:

$$\frac{w_{radial}\ (\text{m/sec.}) \cdot s\ (\text{mm})}{\eta\ (\text{cP})} \leq 0.5$$

B 507,476

TEXTILE PRINT PASTES CONTAINING DISPERSE DYES

Richard Mueller; Rolf Fikentscher; Guenter Meyer, and Knut Oppenlaender, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 19, 1974, Ser. No. 507,476

Claims priority, application Germany, Oct. 1, 1973, 2349229

Int. Cl.² D06P *1/16*

U.S. Cl. 8—62 **4 Claims**

References Cited

UNITED STATES PATENTS

3,223,471	12/1965	Kuth et al.	8/87
3,844,710	10/1974	Reinhandt et al.	8/62

1. A print paste for textile material consisting essentially of a polyester, cellulose acetate, cellulose triacetate and mixtures of the same which contains, in 1000 parts by weight of paste:

a. from 20 to 80 parts by weight of a disperse dye;

b. from 3 to 10 parts by weight of a twofold to sixfold oxyethylated phenol selected from the group consisting of mononuclear and binuclear phenols and bisphenols having a molecular weight of up to 250;

c. from 5 to 30 parts by weight of an ethanolamide of a carboxylic acid of twelve to twenty-four carbon atoms;

d. from 500 to 800 parts by weight of a thickening agent; and

e. water to make up the paste to 1,000 parts by weight.

B 510,458

RADIAL BLOCK COPOLYMERS STABILIZED BY A UREA COMPOUND

Lawrence M. Fodor, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 342,531, March 19, 1973, Pat. No. 3,859,250. This application Sept. 30, 1974, Ser. No. 510,458

Int. Cl.² C08K *5/52*

U.S. Cl. 260—880 B **4 Claims**

References Cited

UNITED STATES PATENTS

2,766,219	10/1956	Beaver	260/45.9 NC
2,781,330	2/1957	Downey	260/45.9 NC
3,355,419	11/1967	Cook	260/45.9 NC
3,355,421	11/1967	Cook	260/45.95 H
3,535,277	10/1970	Miller	260/45.95 H
3,629,372	12/1971	Drake	260/880 B
3,658,743	4/1972	Bevilacqua	260/45.9 NC

1. A composition stabilized against melt flow drop off comprising: a resinous radial block copolymer of a monovinyl-substituted aromatic compound and a conjugated diene having incorporated therein an effective stabilizing amount of a stabilizer system consisting essentially of (a) a sterically hindered phenol, (b) an organic phosphite, and (c) urea.

B 510,998

SHAPED ARTICLE FOR CONDITIONING HAIR FABRICATED FROM QUATERNARY NITROGEN-CONTAINING CELLULOSE ETHER

Joseph A. Faucher, Pleasantville, and Meyer R. Rosen, Spring Valley, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 510,998

Int. Cl.² A45D *24/00*; A61K *7/06*; C08L *1/28*

U.S. Cl. 260—17 R **7 Claims**

References Cited

UNITED STATES PATENTS

2,577,921	12/1951	Samel et al.	132/163
3,346,457	10/1967	Dasher	424/80
3,472,840	10/1969	Stone et al.	260/231
3,715,428	2/1973	Quasius et al.	132/7

FOREIGN PATENTS OR APPLICATIONS

1,144,878	3/1963	Germany	132/7

1. Shaped article for conditioning hair selected from the group consisting of combs, hair brushes and hair curlers which comprises a blend of a normally solid, water soluble organic polymer with a normally solid water insoluble organic polymer in which said polymers are present in an interpenetrating network and in which the ratio of water soluble organic polymer to water insoluble organic polymer is in the range of 99:1 to 1:99.

B 512,373

HINDERED PHENOLIC MONOCYCLIC PHOSPHONATES

John D. Spivack, Spring Valley, and Martin Dexter, Briarcliff, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 421,173, Dec. 3, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,373

Int. Cl.² C07F *9/15*; C08K *5/53*

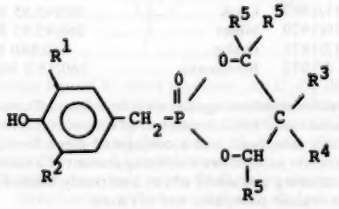
U.S. Cl. 260—937 **8 Claims**

References Cited

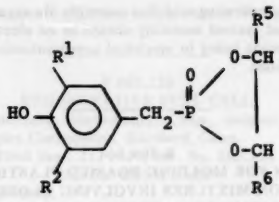
FOREIGN PATENTS OR APPLICATIONS

1,503,429	11/1967	France	260/937

1. A compound having the formula



or



wherein

R^1 is alkyl of 1 to 8 carbon atoms,

R^2 is tert-alkyl of 4 to 8 carbon atoms,

R^3 and R^4 are independently hydrogen or alkyl of 1 to 12 carbons, and

R^5 and R^6 are independently hydrogen, alkyl of 1 to 8 carbon atoms or phenyl, and providing that each R^5 does not have to be the same, or R^5 and R^6 together represent tetramethylene.

B 513,014

2-ALKOXY-3-OXIMINOCYCLOALKENES AND PRODUCTION THEREOF

Milorad M. Rogic, Whippany, and Robert Fuhrmann, Morris Plains, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 372,456, June 21, 1973, abandoned. This application Oct. 8, 1974, Ser. No. 513,014

Int. Cl.² C07C *131/08*

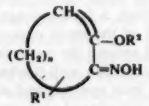
U.S. Cl. 260—566 A **6 Claims**

References Cited

UNITED STATES PATENTS

3,857,510	12/1974	Rogic et al.	260/566 A

1. 2-Alkoxy-3-oximinocycloalkenes of the formula:



wherein n is an integer 2–9, and R^1 is a member of the group consisting of hydrogen, aliphatic C_1–C_{10} saturated hydrocarbon radicals and R^2 is an aliphatic C_1–C_{10} saturated hydrocarbon radical or a cyclic aliphatic C_5–C_6 saturated hydrocarbon radical.

B 516,047

PRODUCTION OF P-HYDROXYCEPHALEXIN

Leonard Bruce Crast, Jr., Clay, and William Joseph Gottstein, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 289,703, Sept. 15, 1972, abandoned. This application Oct. 18, 1974, Ser. No. 516,047

Int. Cl.² C07D *501/12*

U.S. Cl. 260—243 C **2 Claims**

References Cited

UNITED STATES PATENTS

3,708,478	1/1973	Chapman et al.	260/243 C
3,867,380	2/1975	Dunn et al.	260/243 C

1. The process of purifying a crude form of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid which comprises converting said crude acid to its solid, crystalline dimethylformamide solvate containing 1.5 moles dimethylformamide per mole of said acid, isolating said solid solvate, slurrying it in nearly boiling methanol, preferably at about 50° C., until the solvate dissociates, cooling the suspension and then collecting therefrom substantially pure, solid 7-(D-α-amino-4hydroxyphenylacetamido)-3-cephem-4-carboxylic acid.

2. Substantially pure, crystalline dimethylformamide solvate of 7-(D-α-amino-4-hydroxyphenylacetamido)-3-cephem-4-carboxylic acid containing 1.5 moles dimethylformamide per mole of said acid.

B 518,226

SEMICONDUCTOR DEVICE MANUFACTURE

Gordon Kenneth McGinty, Norley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,226

Claims priority, application United Kingdom, Nov. 7, 1973, 51619/73

Int. Cl.² H01L *21/263*

U.S. Cl. 148—1.5 **10 Claims**

References Cited

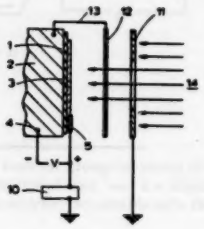
UNITED STATES PATENTS

3,383,567	5/1968	King et al.	148/1.5 X
3,413,531	11/1968	Leith	148/1.5 X
3,547,074	12/1970	Hirschfeld	148/1.5 X
3,717,785	2/1973	Guernet	250/492 A
3,750,083	7/1973	Fayling	335/290

1. A method of holding a semiconductor wafer against a support while effecting a processing step at the surface of the wafer remote from the support, comprising the steps of:

positioning a solid dielectric layer between facing surfaces of a support and a semiconductor wafer, said support and wafer being conductive, at least adjacent to said facing surfaces thereof, said dielectric layer preventing physical and electrical contact between said facing surfaces; and

applying a potential difference between said facing surfaces,



thereby clamping said wafer against said support by electrostatic force across said dielectric layer.

B 519,485

FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS

Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 333,595, Feb. 20, 1973, Pat. No. 3,857,906, which is a division of Ser. No. 49,204, June 23, 1970, Pat. No. 3,725,509. This application Oct. 31, 1974, Ser. No. 519,485

Int. Cl.² C08L *27/08, 75/04*

U.S. Cl. 260—859 R **8 Claims**

References Cited

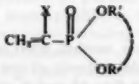
UNITED STATES PATENTS

3,759,851	9/1973	Carl et al.	260/859 PV X
3,780,141	12/1973	Jin et al.	260/859 PV X

1. A fire retardant, thermoplastic polymer composition comprising an intimate admixture of a polyurethane resin formed by reacting a bi- or polyfunctional hydroxyl containing compound with a di- or polysiocyanate and an effective concentration to render said polymer composition flame retardant of a copolymer of:

2. at least one halogen containing, ethylenically unsaturated monomer selected from the group consisting of vinyl halides, vinylidene halides, chlorinated styrenes, halogenated C_1–C_{12} alkyl acrylates and methacrylates, and halo-substituted nitriles of ethylenically unsaturated carboxylic acids; and

2. from about 2.5 to 99%, by weight of at least one bis(hydrocarbyl) vinylphosphonate having the structure:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{12} alkyl and

wherein R and R′ are hydrocarbyl and substituted hydrocarbyl groups which can be the same, different or conjoint.

B 521,125

FLAME-RESISTANT FIBRES OF LINEAR, THERMOPLASTIC POLYESTERS

Jürgen Habermeier, Pfeffingen, and Hans Batzer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,125

Claims priority, application Switzerland, Nov. 13, 1973, 15957/73

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **12 Claims**

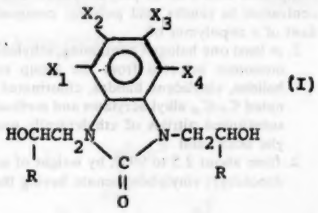
References Cited

UNITED STATES PATENTS

3,860,564 1/1975 Habermeier et al. ..... 260/75 N

1. An improved process for preparing flame-resistant polyester fibers by melt spinning wherein the improvement comprises

melt spinning a copolyester of relative viscosity 1.1–2.0 dl/g, measured at 30°C on a 1% strength solution in equal parts of phenol and tetrachloroethane, consisting essentially in the total condensed diacid component of at least 50 mol % terephthalic acid and from 0 to 50 mol % of isophthalic acid, 2,5-dibromoterephthalic acid or 2,5-dichloroterephthalic acid; and in the total condensed diol component of at least 50 mol % of ethylene glycol or 1,4-butanediol, from 2 to 30 mol % of a diol of formula I



(I)

wherein R is hydrogen, methyl, ethyl or phenyl and X_1, X_2, X_3 and X_4 are independently of one another chlorine or bromine, and from 0 to 48 mol % of an aliphatic diol of 3 to 10 carbon atoms other than 1,4-butanediol; 1,4-cyclohexanediol or 1,4-cyclohexanedimethanol.

B 521,126

FLAME-RESISTANT, THERMOPLASTIC POLYESTERS

Jurgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,126

Claims priority, application Switzerland, Nov. 13, 1973, 15956/73

Int. Cl.² C08G *63/68*

U.S. Cl. 260—75 N **13 Claims**

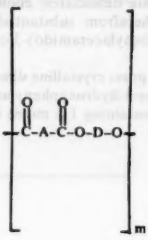
References Cited

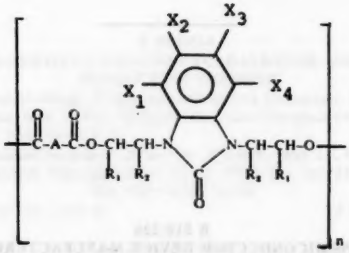
UNITED STATES PATENTS

3,763,269 10/1973 Formaini ..... 260/75 N

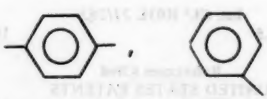
3,860,564 1/1975 Habermeier et al. ..... 260/75 N

1. A flame-resistant, linear, thermoplastic polyester having a relative viscosity of 1.10 to 4.0 dl/g, measured at 30°C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, and characterised by the general formula I





wherein A denotes a radical of the formulae



$-(CH_2)_2-$ or $-(CH_2)_4-$, or a mixture of the above mentioned A radicals; D represents an aliphatic alkylene radical with 2 to 12 carbon atoms or the 1,4-dimethylenecyclohexane radical, or a mixture of the aforementioned D radicals; R_1 each denote a hydrogen atom, or the methyl, ethyl or phenyl group and R_2 denotes a hydrogen atom or together with R_1 denotes the tetramethylene radical, X_1 and X_4 independently of one another represent chlorine, a hydrogen atom or a bromine atom and X_2 and X_3 independently represent a chlorine or a bromine atom, m represents 0 or integers and n represents integers, and the molar fraction $n/(n+m)$ determined by n and m can assume values

B 521,128

UNSATURATED LINEAR POLYESTERS

Hans Batzer, Arlesheim, and Jürgen Habermeier, Pfeffingen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 5, 1974, Ser. No. 521,128

Claims priority, application Switzerland, Nov. 13, 1973, 15954/73; Aug. 6, 1974, 10736/74

Int. Cl.² C08G *63/68*

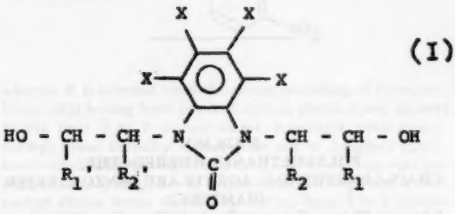
U.S. Cl. 260—75 N **4 Claims**

References Cited

UNITED STATES PATENTS

3,763,269	10/1973	Formaini	260/75 UA
3,860,564	1/1975	Habermeier et al.	260/75 N

1. An unsaturated, flame-retardant, linear polyester consisting essentially in the total condensed acid component of at least 20 mol % of an unsaturated dicarboxylic acid selected from the group consisting of maleic, fumaric, itaconic, citraconic and dimethylmaleic acids and up to 80 mol % of a saturated aromatic or aliphatic dicarboxylic acid selected from the group consisting of phthalic, terephthalic, isophthalic, 2,5-dibromoterephthalic, succinic, glutaric, adipic, pimelic, suberic, azelaic and sebacic acids; and in the total condensed diol component of at least 18 mol % of a brominated or of at least 47 mol % of a chlorinated benzimidazolone diol of formula I



(I)

wherein X independently denotes bromine or chlorine, R_1 and R_1' each denotes hydrogen, methyl, ethyl or phenyl, and R_2 and R_2' each denotes hydrogen or R_1 together with R_2 and R_1' together with R_2' each denote trimethylene or tetramethylene; the amount of diol of formula I incorporated in said polyester being that required to bring the bromine content of said polyester to at least 15 weight % or the chlorine content to at least 20 weight %; and with the remaining condensed diol component selected from the group consisting of ethylene glycol, diethylene glycol, polyethylene glycol of up to 24 carbon atoms, propylene glycol, dipropylene glycol, polypropylene glycol of up to 24 carbon atoms, 1,4-butanediol, 1,12-dodecanediol, neopentyl glycol and 1,4-cyclohexanediol.

B 521,711

METHOD OF USING 6-SUBSTITUTED AMINO PHENYL-,3,5,6-TETRA-HYDRO[2,1-B]THIAZOLES FOR CONTROLLING GASTROINTESTINAL NEMATODES

Larry Dean Spicer, Princeton, and John James Hand, Trenton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 416,464, Nov. 16, 1973, Pat. No. 3,899,583, which is a division of Ser. No. 289,016, Sept. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,939, Aug. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 22,701, March 25, 1970, Pat. No. 3,673,205. This application Nov. 7, 1974, Ser. No. 521,711

Int. Cl.² A61K *31/425*

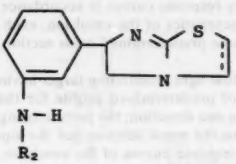
U.S. Cl. 424—270 **4 Claims**

References Cited

UNITED STATES PATENTS

3,505,346	4/1970	Berkelhammer et al.	424/270

1. A method for controlling gastrointestinal nematodes in warm-blooded animals comprising administering to said animals, a nematocidally effective amount of a compound of the formula:



wherein R_2 is selected from the group consisting of naphthoyl, furoyl and adamantyl carbonyl, and ⎓ is a single or double bond and the pharmaceutically acceptable salts thereof.

B 524,026

METHOD OF MAKING LENTICULAR SURFACES

Robert L. Lamberts, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 290,938, Sept. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 186,130, Oct. 4, 1971, abandoned. This application Nov. 15, 1974, Ser. No. 524,026

Int. Cl.² G03C *5/00*, *5/04*

U.S. Cl. 96—35 **19 Claims**

References Cited

UNITED STATES PATENTS

2,794,739	6/1957	Gretener	96/81
3,425,770	2/1969	Mueller et al.	350/162 R
3,582,329	6/1971	Ivanov et al.	96/35
3,592,529	7/1971	Juhlin et al.	350/162 R
3,775,110	11/1973	Bestenreiner et al.	96/81

OTHER PUBLICATIONS

R. L. Lamberts, "Characterization of a Bleached Photographic Material", Jan. '72, Applied Optics, Vol. 11, No. 1.

1. A method of producing an array of cylindrical, lenticular elements on the emulsion surface of a photographic material having operating and frequency response curves in accordance with the photographic characteristics of the emulsion, each of the elements having the same predetermined profile, comprising the steps of:

forming a light modulating target having a cyclical, one-dimensional, profile pattern of the lenticular elements, the profile pattern being mathematically related to the cross section of the predetermined profile and the operating and frequency response curves of the emulsion;

establishing an exposure for the photographic material in accordance with the sensitometric characteristics thereof;

positioning the light modulating target in the object plane of an optical system including a cylindrical lens, the optical system sharply imaging the target profile so as to produce an extending pattern of parallel equal exposure levels normal to the target profile, as represented by spaced parallel lines, in a plane including the emulsion surface of the photographic material;

exposing the photographic material in accordance with the established exposure to a source of light modulated by the target pattern; and

processing the photographic material so as to produce on the emulsion surface a relief image comprising the array of cylindrical lenticular elements having the same predetermined profile.

4. A method of producing an array of lenticules on the emulsion surface of a photographic material having operating and frequency response curves in accordance with the photographic characteristics of the emulsion, each of the elements having the same predetermined cross section, comprising the steps of:

forming a first light modulating target having a first cyclical pattern of predetermined profile for the lenticule cross section in one direction, the pattern being mathematically related to the cross section and the operating and frequency response curves of the emulsion;

forming a second light modulating target having a second cyclical pattern of predetermined profile for the lenticule cross section in an other direction perpendicular to the one direction, the pattern being related to the cross section in the other direction and the operating and frequency response curves of the emulsion;

establishing an exposure for a first and a second photographic material on which the first and second targets are to be exposed, respectively;

positioning successively the first and second targets in the object plane of an optical system including a cylindrical lens, the optical system sharply imaging the targets so as to produce with respect to each cyclical pattern an extending pattern of parallel, equal exposure levels normal to the profile patterns, as represented by spaced parallel lines, in a plane including the emulsion surface of the first and second photographic materials, respectively;

exposing successively the first and second photographic materials in accordance with the established exposure to a source of light modulated, respectively, by the first and second cyclical patterns;

processing the first and second photographic materials to produce respective first and second images comprising parallel regions of equal density corresponding, respectively, to the first and second cyclical patterns;

superimposing the first and second photographic materials in the object plane of a second optical system such that the parallel regions of equal density are oriented relative to one another at an angle greater than zero;

exposing the photographic material positioned in the image plane of the second optical system to the superimposed and oriented images on the first and second photographic materials; and

processing the photographic material so as to produce on the emulsion surface thereof a relief image comprising the array of lenticules having the same predetermined cross section.

B 524,464

WETTABLE POLYOLEFIN BATTERY SEPARATOR

Joseph Cogliano, Baltimore, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,464

Int. Cl.² H01M 2/14

U.S. Cl. 136—148 **4 Claims**

References Cited

UNITED STATES PATENTS

2,653,985	9/1953	Philipps	136/148
3,351,495	11/1967	Larsen	136/146
3,696,061	10/1972	Selsor et al.	136/146
3,702,267	11/1972	Grot	136/146
3,847,676	11/1974	Palmer et al.	136/148

1. In a process for preparing a porous compacted, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator comprising extruding a heated polyolefin through multiple die openings into a gas stream to attenuate the polyolefin into fibers having a diameter of about 1–10 microns, collecting the fibers as a selfsupporting nonwoven mat having a thickness of 20–100 mils, contacting the selfsupporting nonwoven mat with an aqueous system comprising of water and an amount of a surfactant effective for making the selfsupporting nonwoven mat wettable, drying the resulting wettable, selfsupporting, nonwoven mat, and compacting the dried, wettable, selfsupporting, nonwoven mat to form the porous compacted, wettable, selfsupporting, nonwoven mat of polyolefin fiber useful as a battery separator, said compacted mat having a thickness of about 10–40 mils and pores having a pore size of about 10–40 microns, the improvement comprising the presence in the aqueous system of an amount of colloidal silica effective for causing the compacted, wettable, selfsupporting, nonwoven mat to remain wettable after being washed with running water for about 16 hours.

B 528,303

POLYURETHANES WHEREIN THE CHAIN-LENGTHENING AGENTS ARE BENZOIC ESTER DIAMINES

Johannes Blahak, Cologne; Erwin Müller; Uwe Döbereiner, both of Leverkusen; Wolfgang Ebner, Opladen, and Helmut Kleimann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 307,739, Nov. 17, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,303

Claims priority, application Germany, Dec. 7, 1971, 2160589

Int. Cl.² C07C 101/68; C08G 18/32

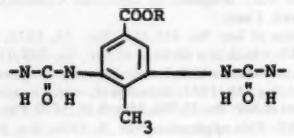
U.S. Cl. 260—18 TN **2 Claims**

References Cited

UNITED STATES PATENTS

3,681,290	8/1972	Meckel et al.	260/77.5 AM
3,794,621	2/1974	Meckel et al.	260/77.5 AM

1. Polyurethane resins containing structural units of the formula:



wherein R is a linear or branched C_1 to C_{20} alkyl radical which may contain oxygen or sulphur.

B 531,096

1-NITROPHENYLPYRIDO [2,3-D] PYRIMIDINE-2,4(1H,3H)-DIONES

Kanji Noda, Chikushino; Akira Nakagawa; Toshiharu Motomura, both of Tosu, and Hiroyuki Ide, Fukuoka, all of Japan, assignors to Hisamitsu Pharmaceutical Co., Inc., Tosu, Japan

Filed Dec. 9, 1974, Ser. No. 531,096

Claims priority, application Japan, Dec. 18, 1973, 48-142771

Int. Cl.² C07D *239/00*

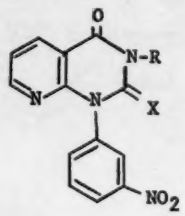
U.S. Cl. 260—256.5 R **3 Claims**

References Cited

UNITED STATES PATENTS

3,235,554	2/1966	Papesch	260/256.4

1. A compound of the formula:



wherein R is selected from the group consisting of hydrogen, lower alkyl having from one to 6 carbon atoms, lower alkenyl having from 3 to 5 carbon atoms, propargyl, cyclopropylmethyl, lower haloalkyl having from one to 3 carbon atoms, lower trihaloalkyl having from one to 3 carbon atoms, vinyloxyethyl, acetoxyethyl, lower hydroxyalkyl having from 2 to 3 carbon atoms, lower alkoxyalkyl having from 2 to 4 carbon atoms, haloallyl, hydroxyethoxyethyl, ethoxycarbonylmethyl, carboxymethyl, 2,3-epoxypropyl, diethylaminoethyl, 4-methylpiperazinoethyl, benzyl, phenethyl and cinnamyl; x is selected from the group consisting of O and S.

B 534,314

ECM AND EDM TOOLING FOR PRODUCING HOLES IN AIRFOIL TRAILING EDGES

Laurance R. Andrews, Agawam, Mass., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1974, Ser. No. 534,314

Int. Cl.² C25F *7/00*; B23K *9/24*

U.S. Cl. 204—224 M **10 Claims**

References Cited

UNITED STATES PATENTS

3,801,489	4/1974	Samson	204/224 M X
3,803,015	4/1974	Andrews	204/224 M
3,842,480	10/1974	Milulski	204/224 M X

1. A device for supporting a plurality of electrode tubes for drilling a row of holes in a workpiece, said device including:

a base,

a locating fixture for a workpiece,

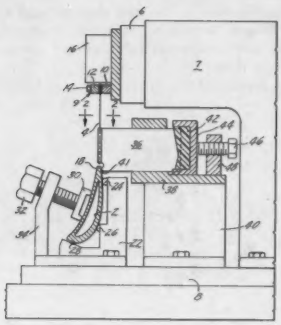
a plurality of electrodes,

a support for the electrodes movable toward and away from the fixture,

a plurality of guides for the electrodes adjacent to the fixture,

a plurality of movable slides in parallel arrangement, one for each guide and on which the respective guides are mounted,

locating means on each slide having a surface engageable with a portion of the workpiece adjacent to the desired location of the hole therein, and



resilient means acting on each slide in a direction substantially at right angles to the movement of the support for holding it against the workpiece with the electrode properly located relative to the workpiece.

B 538,753

PENICILLINS

Wilfried Schröck; Karl-Georg Metzger, and Hans-Bodo König, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 461,227, April 15, 1974. This application Jan. 6, 1975, Ser. No. 538,753

Claims priority, application Germany, Apr. 19, 1973, 2320039

Int. Cl.² C07D *499/68, 499/70*

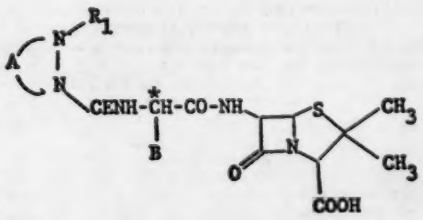
U.S. Cl. 260—239.1 **43 Claims**

References Cited

UNITED STATES PATENTS

3,268,513	8/1966	Grant et al.	260/239.1
3,433,784	3/1969	Long et al.	260/239.1
3,518,253	6/1970	Fosker	260/239.1

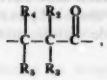
1. A compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R_1 is hydrogen, straight or branched chain alkyl of 1 to 5 carbon atoms, monoaralkyl of up to 8 carbon atoms, monoaryl, or thienyl;

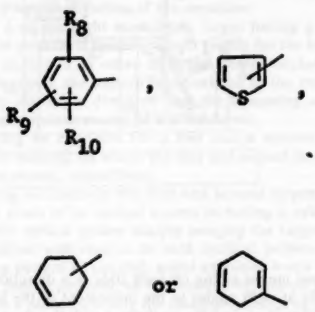
A is a moiety of the formula:



wherein

R_2, R_3, R_4 and R_5 are the same or different and each is hydrogen, straight or branched chain alkyl of 1 to 5 carbon atoms, monoaralkyl of up to 8 carbon atoms, monoaryl, or thienyl;

B is a moiety of the formula:



wherein

R_8, R_9 and R_{10} are the same or different and each is hydrogen, fluorine, chlorine, bromine, iodine, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulphonyl, sulphamyl, nitro, cyano, di(lower alkyl)amino, lower alkanoylamino, lower alkanoyloxy, lower alkylsulphonylamino, trifluoromethyl or hydroxy;

E is oxygen or sulphur; and

C is a carbon atom constituting a center of chirality.

B 542,135

METHOD FOR ENHANCING THE BONDABILITY OF METALLIZED THIN FILM SUBSTRATES

Arthur L. Prest, Watertown, Mass., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 17, 1975, Ser. No. 542,135

Int. Cl.² C25D 5/02, 5/24

U.S. Cl. 204—15 **6 Claims**

References Cited

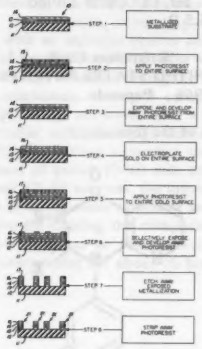
UNITED STATES PATENTS

3,467,540	9/1969	Schick	204/29
3,745,094	7/1973	Greene	204/15
3,862,875	1/1975	Uchytil	204/15

1. A method for enhancing the bondability of a metallized substrate having a conductive material electroplated thereon, the method comprises the steps of:

coating the entire metallized substrate with a positive liquid photoresist;

exposing and developing away the entire coating of the positive liquid photoresist; and



electroplating the conductive material on the metallized substrate.

B 545,464

OCTAHYDROPYRINDINE PHOSPHORYLACYLAMINES

Elmar Sturm, Aesch, Switzerland, and Hans Jörg Cellarius, deceased, late of Riehen, Switzerland (by Herta Cellarius-Haigermoser, legal representative), assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 324,469, Jan. 17, 1973, Pat. No. 3,876,643. This application Jan. 30, 1975, Ser. No. 545,464

Claims priority, application Switzerland, Jan. 20, 1972, 910/72

Int. Cl.² C07F 9/165, 9/40

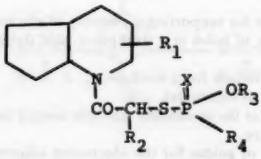
U.S. Cl. 260—293.54 **9 Claims**

References Cited

UNITED STATES PATENTS

3,134,801	5/1964	Sehring et al.	260/293.85
3,772,312	11/1973	Sturm et al.	260/293.54
3,806,560	4/1974	Kishino et al.	260/293.85

1. A phosphorylacylamine compound of the formula



wherein each of R_1 and R_2 is hydrogen or methyl; R_3 is alkyl of from 1 to 4 carbon atoms; R_4 is alkyl, alkoxy or alkylthio of from 1 to 4 carbon atoms; and X is oxygen or sulphur.

B 552,489

LINEAR, THERMOPLASTIC POLYESTERS

Lothar Buxbaum, Lindenfels, Germany; Jurgen Habermeier, Pfeffingen, and Hans Batzer, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 488,625, July 15, 1974. This application Feb. 24, 1975, Ser. No. 552,489

Claims priority, application Switzerland, July 30, 1973, 11054/73

Int. Cl.² C08G *63/68*

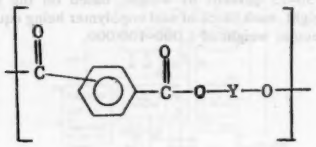
U.S. Cl. 260—75 N 6 Claims

References Cited

UNITED STATES PATENTS

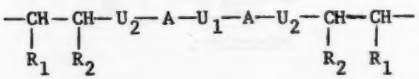
3,856,754	12/1974	Habermeier et al.	260/75 N
3,860,564	1/1975	Habermeier et al.	260/75 N

1. A linear, thermoplastic polyester or random copolyester having a relative viscosity of 0.5 – 4.0, measured at 30°C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, characterised by a repeating unit of the general formula I

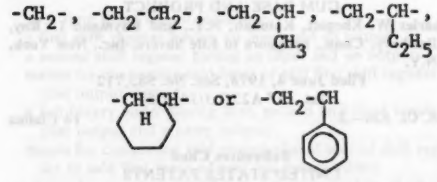


(I)

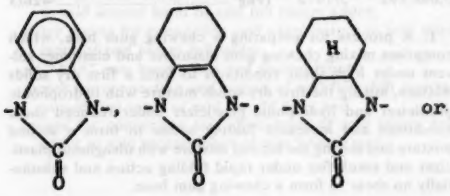
wherein the carbonyl groups can be linked to the aromatic rings in the meta- and/or para-position, Y represents *m* moles of E and *n* moles of

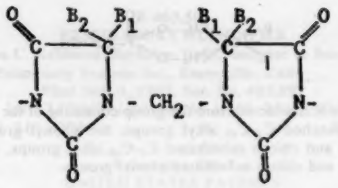


in a mixture so general formula I represents a random copolymer except when *m* is zero and only one acid component is used, E represents an aliphatic radical with 2 to 10 carbon atoms which is linear or is branched by means of a methyl or ethyl group, or the 1,4-dimethylenecyclohexane radical, R_1 in each case denotes a hydrogen atom, or a methyl, ethyl or phenyl group, and R_2 denotes a hydrogen atom or, conjointly with R_1, denotes the tetramethylene radical, A denotes a radical of the formulae

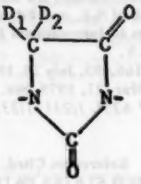


U_1 denotes a radical of the following formulae





wherein B_1 and B_2 independently of one another each denote a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms, and U_2 has the same meaning as U_1 or denotes a radical of the formula



wherein D_1 and D_2 independently of one another each denote a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms or the phenyl group or, conjointly, denote the pentamethylene radical, *m* represents 0 or integers and *n* represents integers, it being possible for the mol fraction $n/(n+m)$ derived from *n* and *m* to assume values from 0.02 to 1.

B 557,856

PROCESS FOR FORMING A FLAME RETARDANT ARTICLE AND ARTICLE THEREOF

Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 460,399, April 12, 1974, Pat. No. 3,887,656. This application Mar. 12, 1976, Ser. No. 557,856

Int. Cl.² C08G *18/14*; B05D *1/02, 1/28*

U.S. Cl. 260—2.5 AJ 13 Claims

References Cited

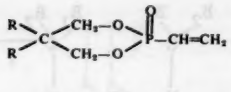
UNITED STATES PATENTS

3,033,887	5/1962	Wadsworth et al.	260/937
3,033,888	5/1962	Wadsworth et al.	260/937
3,257,480	6/1966	Hechenbleikner et al.	260/937
3,382,301	5/1968	Hechenbleikner et al.	260/2.5 AJ

OTHER PUBLICATIONS

Pudovik et al., Chem. Abs., Vol. 64 (1965) 159166.

8. A flame retardant article comprising a substrate and an effective amount of flame retarding of a compound having the formula:



wherein R is selected from the group consisting of the straight and branched C_1–C_{12} alkyl groups, the phenyl group, the bromo and chloro substituted C_1–C_{12} alkyl groups, and the bromo and chloro substituted phenyl groups.

B 560,717

FLAVORING WITH 2,4,6-TRIMETHYL-S-TRITHIANE

Richard Arnold Wilson, Edison; Ira Katz, Elberon; Manfred H. Vock, Locust, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 166,683, July 28, 1971, abandoned. This application Mar. 21, 1975, Ser. No. 560,717

Int. Cl.² A23L *1/231, 1/235, 1/226*

U.S. Cl. 426—535 **1 Claim**

References Cited

UNITED STATES PATENTS

2,213,804	9/1940	Lincoln et al.	260/327 UX
2,594,379	4/1952	Barch	426/533

OTHER PUBLICATIONS

Chem. Abstracts, Vol. 44, 1950, 16952c, Abstracting Food Research, pp. 15322–15325, (1950).

Pippen et al., Hydrogen Sulfide, A Direct and Potentially Indirect Contributor to Cooked Chicken Aroma, J. Food Science, 34, 1969, pp. 443–446.

1. A process for altering, modifying or enhancing the black currant flavor of a foodstuff having a black currant taste which comprises adding thereto from about 0.02 up to 100 parts per million by weight of a substantially pure form of 2,4,6-trimethyl-S-trithiane.

B 561,387

SMOKE-RETARDANT FOR CHLORINATED POLYETHYLENE AND VINYL CHLORIDE POLYMERS

Edward L. Kay, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Mar. 24, 1975, Ser. No. 561,387

Int. Cl.² C08J *3/20*

U.S. Cl. 260—45.75 W **5 Claims**

References Cited

UNITED STATES PATENTS

3,524,761	8/1970	Humphrey	260/45.75 W
3,869,420	3/1975	Mathis et al.	260/45.7 R

OTHER PUBLICATIONS

Fire and Flammability Series – Vol. 7 – Flammability of Solid Plastics (1974), pp. 251–275.

1. A polymer composition of the class consisting of chlorinated polyethylene and polyvinyl chloride which polymer has a chlorine content of 10 to 75 per cent and is compounded with 1 to 25 parts of zinc borate ($2ZnO.3B_2O_3.3.5\ H_2O$) and 6 to 150 parts of $Al_2O_3.3H_2O$ which act synergistically as a smoke suppressant when the polymer composition is burned.

B 575,851

HYDROGENATED BLOCK COPOLYMERS OF BUTADIENE AND ISOPRENE

Shingo Futamura, Seville, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 484,486, July 1, 1974. This application May 8, 1975, Ser. No. 575,851

Int. Cl.² C08F *15/04, 15/40*

U.S. Cl. 260—876 B **11 Claims**

References Cited

UNITED STATES PATENTS

3,452,118	6/1969	Winkler et al.	260/879
3,465,063	9/1969	Hassell et al.	260/876

1. A hydrogenated block copolymer of improved permanent set and related properties comprising essentially at least 5–15 alternating blocks of hydrogenated butadiene and hydrogenated isoprene, which hydrogenated isoprene block may contain up to 50 percent by weight of hydrogenated butadiene, the hydrogenated butadiene portions representing 5–70 percent by weight and the hydrogenated isoprene portions representing 30–95 percent by weight, based on the total copolymer weight, each block of said copolymer being equivalent to a molecular weight of 1,000–100,000.

B 583,712

METHOD AND APPARATUS FOR FORMING CHEWING GUM BASE AND PRODUCT

Charles W. Ehrgott, Katonah, N.Y., and Raymond L. Roy, Danbury, Conn., assignors to Life Savers, Inc., New York, N.Y.

Filed June 4, 1975, Ser. No. 583,712

Int. Cl.² A23G *3/30, 3/00*

U.S. Cl. 426—3 **14 Claims**

References Cited

UNITED STATES PATENTS

2,489,147	11/1949	Lougovoy	426/3
2,635,964	4/1953	Hewitt	426/3
3,666,492	5/1972	Teng	426/3

1. A process for preparing a chewing gum base, which comprises mixing chewing gum elastomer and elastomer solvent under high shear conditions to form a first dry solids mixture, mixing the first dry solids mixture with hydrophobic plasticizer and hydrophilic plasticizer under reduced shear conditions and increased folding action to form a second mixture and mixing the second mixture with oleaginous plasticizer and emulsifier under rapid folding action and substantially no shear to form a chewing gum base.

B 78,315

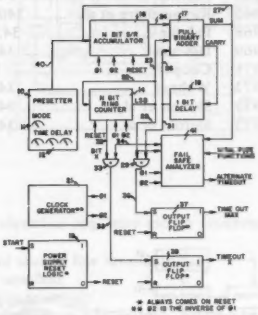
MINIPOWERED OPTIONAL SELF CHECKING ELECTRONIC TIMER FOR ORDNANCE

John E. Newton, East Aurora, N.Y.; Maxine Bohacz, Denville, and Jerry H. Lyon, Stanhope, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 3, 1970, Ser. No. 78,315
Int. Cl.[2] H03K *5/13, 5/159*
U.S. Cl. 328—129 9 Claims

References Cited
UNITED STATES PATENTS

3,108,228	10/1963	Clapper	328/43
3,371,579	3/1968	Kinzelman	236/92 T



1. A time delay circuit including:
a first shift register having an input and an output;
a second shift register having an input and an output;
means for connecting said input of said first shift register to said output thereof;
a full binary adder having first, second and third inputs, a sum output and a carry output;
means for connecting said output of said second shift register to said first input of said full binary adder;
means for connecting said sum output to said input of said second shift register;
means for connecting said output of said first shift register to said second input of said full binary adder;
delay means for connecting said carry output to said third input of said binary full adder;
an "And" gate having first and second inputs;
means for connecting said output of said first shift register to said first input of said "And" gate; and
means for connecting said third input of said binary full adder to said second input of said "And" gate.

B 403,507

RESPIRATORY HUMIDIFIER

Thomas C. Robinson, Berkeley, Calif., assignor to Searle Cardio-Pulmonary Systems Inc., Emeryville, Calif.

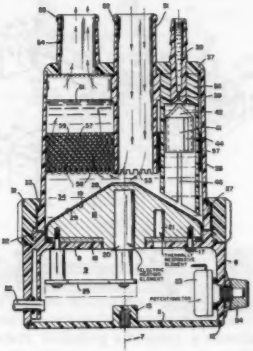
Filed Oct. 4, 1973, Ser. No. 403,507
Int. Cl.[2] H05B *1/00;* A61M *15/00;* B01F *3/04*
U.S. Cl. 219—273 8 Claims

References Cited
UNITED STATES PATENTS

1,116,931	11/1914	Schutt	137/202
1,373,072	3/1921	Holmberg	137/202 X
1,664,333	3/1928	Taylor	261/122 X
2,082,363	6/1937	Stone	261/123
2,164,881	7/1939	Meyerson	128/192
3,659,604	5/1972	Melville et al.	219/272 UX
3,757,082	9/1973	Goicoechea	219/271
3,804,280	4/1974	Van Amerongen et al.	128/194 X
3,806,102	4/1974	Valemta et al.	261/122 X
3,864,440	2/1975	Goicoechea	219/271 X

FOREIGN PATENTS OR APPLICATIONS

487,396	12/1938	United Kingdom	261/122
269,045	11/1929	Italy	219/438



1. A respiratory humidifier comprising a base, a heater mounted on said base and having a first heat transfer surface, a container having a second heat transfer surface complementary to said first heat transfer surface, means associated with said base and said container for urging said first heat transfer surface and said second heat transfer surface substantially into abutment, means on said container for admitting liquid to the interior thereof at a lower location near said second heat transfer surface, means for establishing a predetermined liquid level in said container, means on said container for admitting gas to the interior thereof at a location near said second heat transfer surface and below said liquid level, means on said container for releasing gas therefrom at an upper location remote from said second heat transfer surface and above said liquid level, and a pad in and extending substantially completely across said container and disposed between said lower location and said upper location, said pad being permeable throughout to said liquid and to said gas and providing an extended surface for wetting by said liquid and said pad having an upper surface substantially coincident with said liquid level.

B 463,388

ELECTRICALLY HEATED PARTING TOOL FOR REMOVING WINDSHIELDS

Hans Kraus, 5156 Banna Ave., Covina, Calif. 91724, and Wesley R. Willhite, Jr., 1345 N. Birchnall Ave., San Dimas, Calif. 91773

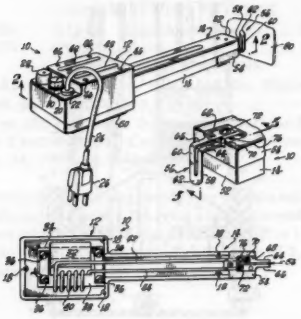
Filed Apr. 23, 1974, Ser. No. 463,388
Int. Cl.² H05B *1/00*; B26B *3/08*
U.S. Cl. 219—233 **3 Claims**

References Cited
UNITED STATES PATENTS

1,834,555	12/1931	Tittle	219/233 UX
2,012,938	9/1935	Beuoy	219/233
2,200,322	5/1940	Armesen	219/233 UX
2,421,125	5/1947	Krebs	30/140
2,501,192	3/1950	Scholler	219/233
2,701,835	2/1955	Amton	30/140
2,709,743	5/1955	Mitchell	219/235 X
2,978,565	4/1961	Sullivan et al.	219/221 X
3,263,540	8/1966	Lefevre et al.	83/171
3,448,517	6/1969	Cothery	30/140
3,558,854	1/1971	Siegel et al.	219/233

FOREIGN PATENTS OR APPLICATIONS

832,358	6/1938	France	128/303.14
1,315,489	12/1962	France	219/233



1. A parting tool comprising:

an elongate blade-like element constructed of relatively thin flat sheet metal and having base and tip ends, said element having a longitudinal slot opening at one end through the base end of said element and terminating at its other end a distance from the tip end of said element, whereby said element has a generally U-shape including a pair of thin flat leg portions disposed in spaced side by side coplanar relation and a thin flat connecting portion joining said leg portions at the tip end of said element, said leg portions having opposite free ends,

a realtively long and slender holder having at one end a high temperature heat resistive ceramic-like thermal insulating support member recessed into one side of said holder,

means securing said free ends of said element leg portions to said insulating support member with said free ends recessed into said support member and with the blade-like element extending longitudinally from said one end of the holder, whereby said holder supports said element for application to work material,

said element having a right angle bend between said holder end and said connecting portion whereby said element base and tip ends lie at opposite sides of said bend and are disposed in mutually transverse relationship, the tip end of said element extending laterally of and toward the opposite side of said holder in spaced relation to said holder end, and

electrical circuit means carried by said holder and connected to said free ends of said element leg for providing an electrical current flow to said element leg and connecting portions to heat said element.

B 484,029

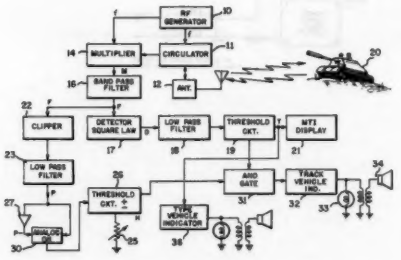
MOVING TARGET INDICATING (MTI) RADAR SYSTEMS EMPLOYING VEHICLE DISCRIMINATOR APPARATUS

Otto E. Rittenbach, Neptune, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1974, Ser. No. 484,029
Int. Cl.² G01S *9/42*; G08B *13/22*
U.S. Cl. 343—7.7 **13 Claims**

References Cited
UNITED STATES PATENTS

3,098,971	7/1963	Richardson	343/6.8 R X
3,150,363	9/1964	Finvold	343/5 SA
3,181,150	4/1965	Ruppersberg et al.	340/258 A
3,383,678	5/1968	Palmer	343/7.7 X
3,431,405	3/1969	Dawson	343/5 SA
3,631,489	12/1971	Cooper	343/7.7
3,636,562	1/1972	Wehner	343/5 SA
3,719,945	3/1973	Sletten et al.	343/5 SA
3,725,917	4/1973	Sletten et al.	343/5 SA



3. In a moving target indicator radar system of the type including a receiver capable of responding to a return or echo signal reflected from a target within the range of a radar transmitter, which generates a signal free of harmonics, wherein said returned signal includes a Doppler frequency component containing information relative to the nature or type of target, in combination therewith apparatus for identifying the type of target, comprising:

a. first means included in said receiver and responsive to the reception of said returned signal for detecting the magnitude of an even harmonic component of said Doppler component at an output thereof, and

b. means coupled to the output of said first means for providing a control signal when said magnitude of said even harmonic component exceeds a predetermined level indicative of the presence of a moving target of a given nature.

B 501,181
LINE POWERED VOLTAGE REGULATOR
John Edward Edington, Holmdel, N.J., and Richard Cecil Fitch, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 28, 1974, Ser. No. 501,181
Int. Cl.[2] G05F 1/58
U.S. Cl. 323—22 T 16 Claims

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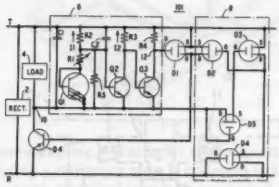
3,828,240	8/1974	Keller et al.	323/22 T



2. An electrical regulator circuit comprising, in combination:

first and second line terminals;

a load terminal;

an output terminal;

a drive transistor having base, emitter and collector electrodes connected to said second line terminal and said load terminal, respectively, said drive transistor being adapted to supply a load current to said load terminal to develop a reference voltage between said load terminal and said first line terminal;

a starting circuit connected between said first and second line terminals, said starting circuit comprising second, third, fourth and fifth transistors each having gate, source and drain electrodes;

said second transistor having said gate, source and drain electrodes respectively connected to said drain electrode of said third transistor, said first line terminal, and said base electrode of said drive transistor;

said third transistor having said gate, source and drain electrodes respectively connected to said source electrode of said fifth transistor said first line terminal and said source electrode of said fourth transistor;

said fourth transistor having said gate and drain electrodes connected to said second line terminal; and

said fifth transistor having said gate and said drain electrodes connected to said load terminal, whereby said starting circuit, in response to the application of a voltage between said first and second line terminals, supplies a drive current to said base electrode of said drive transistor when said reference voltage is less than a preselected threshold so that said drive transistor is activated to supply said load current, and whereby said starting circuit ceases to provide said drive current when said reference voltage exceeds said preselected threshold;

voltage sensing means connected between said load terminal and said first line terminal for sensing said reference voltage and producing a control voltage at said output terminal proportional to said reference voltage; and

a current source responsive to said control voltage when said reference voltage exceeds said preselected threshold for supplying said drive current to said base electrode of said drive transistor, whereby said reference voltage can be regulated at a preselected level.

B 507,396
FIBEROPTIC FLUID LEVEL SENSING MECHANISM
Frank M. Kulig, Bloomfield, Conn., assignor to The J.M. Ney Company, Bloomfield, Conn.
Filed Sept. 19, 1974, Ser. No. 507,396
Int. Cl.[2] G01N 21/26
U.S. Cl. 250—577 10 Claims

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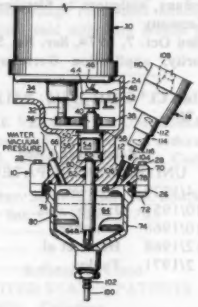

1. In a piece of process equipment, operable for performing process operations on various fluid materials including liquids, slurries and powders, including a housing, a chamber formed in the housing, a shaft having at least a portion of the length thereof disposed in the chamber, motor means supported in the housing and operatively connected to the shaft for imparting rotation to the shaft, inlet means formed in the housing communicating with the chamber operable for supplying fluid material thereto, outlet means formed in the housing communicating with the chamber operable for dispensing fluid material therefrom, the improvement consisting of a fluid level sensing mechanism operable for sensing the level of the fluid material in the chamber, said mechanism comprising:

a. light projecting means mounted in the housing providing communication between the exterior of the housing and the interior of the chamber, said light projecting means being positionable in juxtaposed relation to an external light source for receiving light rays therefrom and operable to direct the light rays received thereby into the interior of the housing to light the chamber provided therewithin;

b. light transmitting means mounted within the housing and having at least a portion thereof positioned in the path of the light rays being directed into the interior of the housing through the operation of said light projecting means, said light transmitting means comprising a fiberoptic bundle supported within the shaft so as to be rotatable therewith and having one end thereof located within the chamber, said one end of said fiberoptic bundle projecting outwardly of the shaft so as to thereby be exposed, said one end of said fiberoptic bundle being struck by the

light rays being directed within the chamber when the level of the fluid material therein falls to a level sufficient to render visible said one end of said fiberoptic bundle, said fiberoptic bundle during the rotation thereof being operable to transmit the light rays striking said one end thereof the length of said fiberoptic bundle;

c. photoelectric means mounted in the housing in juxtaposed relation to the other end of said fiberoptic bundle, said photoelectric means including a photoelectric receiver located in the path of the light rays being transmitted the length of said fiberoptic bundle, said photoelectric receiver being actuated in response to being struck by light rays transmitted thereto from said fiberoptic bundle; and

d. electrical circuit means including a control relay and operable to connect said control relay and said photoelectric receiver in circuit relation, said control relay being operated in response to actuation of said photoelectric receiver to perform a control function effecting the operation of the piece of process equipment.

B 512,964

LIQUID JET RECORDER

Siegfried Wiesmuller, Nurnberg, and Helmut Kraus, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Oct. 7, 1974, Ser. No. 512,964

Claims priority, application Germany, Oct. 10, 1973, 2350870

Int. Cl.[2] G01D *15/18*; B41J *3/04*

U.S. Cl. 346—75 **5 Claims**

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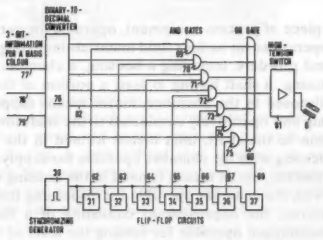

1. In a liquid jet recorder having at least one jet nozzle; a pressure means conduit connected to said jet nozzle for causing the latter to propel a jet of an electrically-conductive recording liquid onto a recording carrier; and at least one control electrode connected to a signal source for modulating said liquid jet in the sense of effecting a point wise recording, the improvement comprising: a plurality of impulse generators in said signal source in conformance with the number of desired color increments for each image point on said recording carrier, said impulse generators having synchronous impulse sequences, equal impulse amplitudes and differentiated from each other with respect to the sensing ratios of said color increments; and means for connecting the impulse generator required for recording the desired color increment on an image point to the electrode associated with said image point for a recording time period equal for all image points.

B 515,452

FAULT DETECTION INDICATOR

Floyd Leonard Malmborg, Brookfield Center, Conn., assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 17, 1974, Ser. No. 515,452

Int. Cl.[2] H01F *7/08*

U.S. Cl. 335—253 **12 Claims**

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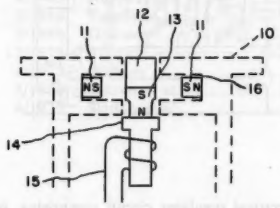

1. A fault indication device adapted to being excited by an electrical voltage for indicating a fault condition comprising;

a housing;

an indicating element including an indicating element permanent magnet having first and second end portions of opposite magnetic polarity, said indicating element being free to move in a first predetermined direction within said housing;

a ferromagnetic core and coil assembly, the coil being a conductive wire wound about said, said coil having input terminals for application of an electrical voltage, said permanent magnet indicating element having its first end portion being disposed on the end surface of said core when said coil is not excited by an electrical voltage;

and at least one latching permanent magnet having first and second end portions of opposite magnetic polarity and being free to move within said housing in a direction at right angles to said first predetermined direction, said latching permanent magnet being oriented so that during said unexcited condition of said coil said latching permanent magnet is repelled by the second end portion of the indicating element permanent magent, said input terminals being adapted to receiving an exicitation voltage which causes a magnetic polarity to appear on said core and which is repelling to said first end portion of said indicating element permanent magnet thereby forcing said indicating element to move in said first predetermined direction, whereby said second end portion of said indicating element permanent magnet is juxtaposed proximate to said latching permanent magnet thereby attracting said latching permanent magnet to said indicating element permanent magnet.

B 528,761
CONTACT SPRING FOR VARIABLE RESISTANCE DEVICE

Ronald Eugene Smith, Riverside, Calif., assignor to Bourns, Inc., Riverside, Calif.

Filed Dec. 2, 1974, Ser. No. 528,761
Int. Cl.² H01C 1/12
U.S. Cl. 338—202 15 Claims

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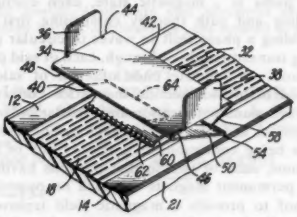

1. A contact spring, suitable for use in a variable resistance device having a resistance strip, a collector strip adjacent said resistance strip, electrical terminals associated with said resistance and collector strips, and means to move a contact spring across the surfaces of said resistance and collector strips, said contact spring comprising:

a base member adapted for attachment to said spring moving means,

electrically conductive contact means depending from said base member, said contact means comprising a cantilever spring means adapted for sliding electrical contact with said resistance and collector strips so as to effect a short circuit therebetween, and

a stiffly flexible, resilient back-up means depending from said base member toward said contact means, said back-up means being disposed in the flexing path of said contact means to retard flexing thereof toward said base member,

whereby a substantially greater contact force is established between said contact means and said resistance and collector strips when said contact means flexes into said back-up means than would be established by the spring force of said contact means alone.

B 540,218
APPARATUS AND METHOD FOR MEASURING CAPACITANCE

Edwin Paul Thomas, Brick Town, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 10, 1975, Ser. No. 540,218
Int. Cl.² G01R 27/26
U.S. Cl. 324—60 C 3 Claims

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3,668,523	6/1972	Kuhn	324/60 C X
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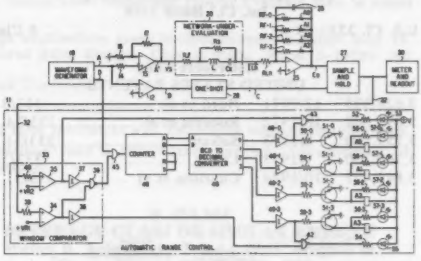
1. In apparatus for measuring the capacitance value of a network-under-evaluation of the type employing a periodic ramp signal which is applied to the network and means for sampling and holding the value of current developed in the network at the instant that the ramp signal passes through a prescribed amplitude value, apparatus for obtaining range control of a signal representative of the capacitance value comprising,

controllable means in circuit relationship with the network-under-evaluation and said sampling and holding means for generating an output signal proportional to the amplitude of the current developed in the network-under-evaluation, said controllable means including means for adjusting the amplitude of said output signal to be within a predetermined voltage range and means for generating signals to control said adjusting means to effect range control.



B 554,939
LAST LINE VELOCITY COMPENSATION

Maurice G. Lemoine, and Leonard A. Pasdera, both of Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 3, 1975, Ser. No. 554,939
Int. Cl.² H04N 5/795
U.S. Cl. 358—8 17 Claims

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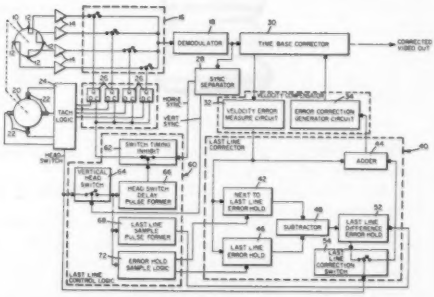

1. A method of determining last line velocity error in a time varying signal including time base information reproduced from a record medium by a plurality of transducers between which reproduction of the signal is switched comprising the steps of determining the last line velocity error occurring during a certain last determined period of said signal before transducer switchings, and adjusting each of the last line velocity errors occurring during other last determined periods of said signal before transducer switchings in accordance with said determined last line velocity error.

B 568,770

MONOLITHIC RECIPROCAL LATCHING FERRITE PHASE SHIFTER

Peter W. Smith, and An-Hwa Soong, both of Westport, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Apr. 16, 1975, Ser. No. 568,770
Int. Cl.[2] H01P 1/18
U.S. Cl. 333—31 A 5 Claims

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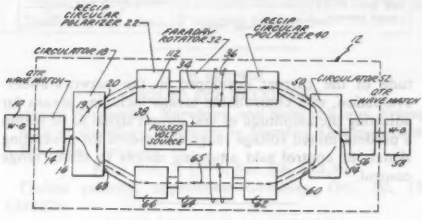

1. A reciprocal, latching ferrite phase shifter for providing selectable phase delays to linearly polarized microwaves of electromagnetic radiation propagating between wave transmission waveguides in opposite directions, comprising:

a plurality of electrical coil windings;

a plurality of permanent magnets; and

a geometrically symmetrical, monolithic, solid ferrite structure of generally rectangular shape, having a pair of ends of rectangular cross-section and adapted to interface with a related waveguide, said structure having a centrally disposed slot extending transversely entirely through said structure and extending longitudinally along a substantial portion of said structure providing a pair of similar, independent wave transmission paths, one of said windings being disposed around each of said paths and operable in response to voltage pulses applied thereto for latching said paths in a magnetic state, each configuration of winding and path thereby comprising first means for providing a phase shift to waves of circular polarization being transmitted therethrough, each of said paths having portions, at opposite ends of each of said windings, shaped to provide second means for converting waves between plane polarization and circular polarization in a reciprocal fashion, each of said second means of said paths being contiguous to a related one of two further portions, each of said further portions having a pair of said permanent magnets disposed on opposite surfaces thereof to provide a magnetic field transverse to the longitudinal axis of said structure and each further portion being shaped to provide, in combination with said pair of magnets, third means for providing selective, directional propagation of waves such that waves propagating into the respective end of said structure from the related waveguide pass into one of said paths but not into the other of said paths and waves propagating from the other of said paths pass through the respective end of said structure into the related waveguide but not into the other one of said paths.

DESIGN APPLICATIONS

PUBLISHED FEBRUARY 10, 1976
UNDER THE SECOND TRIAL VOLUNTARY PROTEST PROGRAM

NOTE.—A copy of the notice setting forth the details of the Second Trial Voluntary Protest Program may be found in the Patent and Trademark Notices section of this issue.

Any protests relating to the patentability of these published design applications must be filed in writing before May 10, 1976. These applications are available for inspection in the Allowed Files Branch, Crystal Plaza, Room 2-10C28. All correspondence should be addressed to:

Commissioner of Patents and Trademarks
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Washington, D.C. 20231

Printed copies of the published design applications may be purchased from the Patent and Trademark Office at 20 cents each.

An "Index of Design Applicants and Assignees of Design Applications" and a concordance entitled "Classification of Published Design Patent Applications" are located in the back of this issue.

B 414,971
POWER UNIT FOR A BLENDER OR THE LIKE
Alfred W. Madl, Glendale, and Charles J. Kirschling, Milwaukee, Wis., assignors to Oster Corporation, Milwaukee, Wis.
Filed Nov. 12, 1973, Ser. No. 414,971
Int. Cl. D7—*04*
U.S. Cl. D7—154

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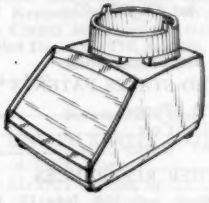

B 424,354
BEVERAGE GLASS OR SIMILAR ARTICLE
Walter B. Achenbach, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Dec. 13, 1973, Ser. No. 424,354
Int. Cl. D7—*01*
U.S. Cl. D7—15

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B 430,287
MOUTHPIECE FOR BREATH TESTING DEVICES OR THE LIKE
James E. Burroughs, Mount Prospect, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 2, 1974, Ser. No. 430,287
Int. Cl. D24—*02*
U.S. Cl. D83—1 N

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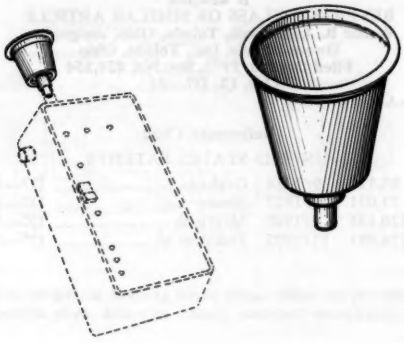

B 487,062
ELECTRONIC CALCULATOR
Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed July 10, 1974, Ser. No. 487,062
Int. Cl. D14—*02*
U.S. Cl. D26—5 C

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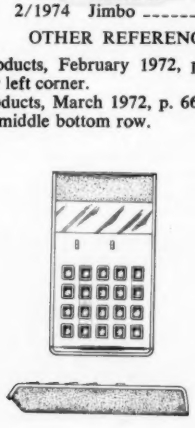

B 491,906
JAR
George W. Welker III, Downingtown, Pa., assignor to American Home Products Corp., New York, N.Y.
Filed July 25, 1974, Ser. No. 491,906
Int. Cl. D9—*01*
U.S. Cl. D9—71

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B 510,346
POPCORN POPPER COVER
Gary L. Vandeberg, Fox Lake, Wis., assignor to Dart Industries Inc., Los Angeles, Calif.
Continuation of abandoned design application Ser. No. 280,327, Aug. 14, 1972. This application Sept. 30, 1974, Ser. No. 510,346
Int. Cl. D7—*02*
U.S. Cl. D7—131

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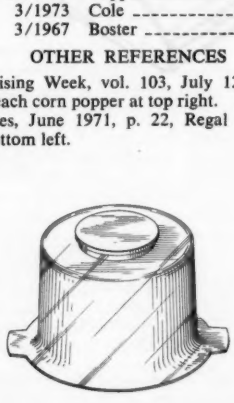

B 527,788
COUNTERWEIGHT FOR A LIFT TRUCK
Donald J. De Priester and Darrell C. Fuller, Niles, and Jack E. Loomis, Kalamazoo, Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed Nov. 27, 1974, Ser. No. 527,788
Int. Cl. D12—*05*
U.S. Cl. D12—60

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B 532,424
FOOT BATH
Scott W. Miller, Stratford, James Bartlett Wyatt, Stamford, and Kenneth Van Dyck, Westport, Conn., assignors to Clairol Incorporated, New York, N.Y.
Filed Dec. 13, 1974, Ser. No. 532,424
Int. Cl. D24—*04*
U.S. Cl. D83—1 C

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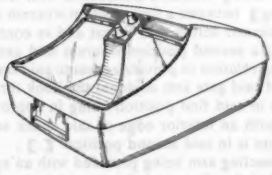

B 548,462
PAIR OF SPECTACLES
Richard Canavan III, South Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Feb. 10, 1975, Ser. No. 548,462
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

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Optometric Weekly, Apr. 19, 1973, p. 23, Style-Rite Optics Inc. cat., insert p. 4, Dorado frames.

B 561,062
COMBINED VARIABLE POWER SUPPLY AND CIRCUIT TESTER
Joseph Don Jack, 314 Warren St., Harrison, N.J. 07029
Continuation-in-part of abandoned design applications Ser. Nos. 485,427, 485,428, and 485,429, all filed July 3, 1974. This application Mar. 24, 1975, Ser. No. 561,062
Int. Cl. D19—*07*
U.S. Cl. D19—62

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D. 225,531	12/1972	Flynn et al.	D19—62
D. 229,563	12/1973	Sirkin et al.	D19—62
D. 235,440	6/1975	Valentine	D19—62
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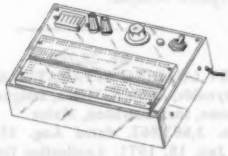
3,008,245	11/1961	Meuche	35—19 A
3,845,573	11/1974	Kasamatsu	35—19 A



REISSUES

FEBRUARY 10, 1976

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

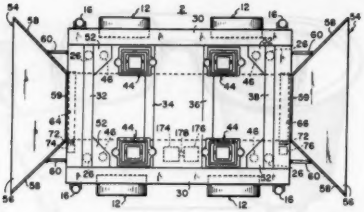
Re. 28,707
MULTI-PURPOSE VEHICLE FOR USE UNDERGROUND

Jon R. Swoager, Imperial, Pa., assignor to Automation Equipment, Inc., Imperial, Pa.

Original No. 3,851,481, dated Dec. 3, 1974, Ser. No. 406,971, Oct. 16, 1973. Division of Ser. No. 299,354, Oct. 20, 1972, Pat. No. 3,811,290, which is a continuation-in-part of Ser. No. 241,975, April 7, 1972, Pat. No. 3,793,966. Application for reissue Mar. 27, 1975, Ser. No. 562,504

Int. Cl.² E21D *15/44*

U.S. Cl. 61—45 D 1 Claim



1. A self-propelled vehicle for use in underground excavations having a floor and a ceiling, said vehicle comprising:
- a frame;
- wheel assemblies supporting said frame, said wheel assemblies being independently suspended and steerable;
- a body supported on said frame;
- first lifting means supported by said frame for raising said body above said frame;
- a plurality of rotatable chuck assemblies disposed within said body and adapted to engage a workpiece for insertion into said ceiling;
- second lifting means supported by said body and engaging said chuck assemblies for raising said chuck assemblies above said body;
- a pair of movable scoop containers mounted on said frame at opposite ends thereof;
- a reversible conveyor supported by said frame and positioned to transport material from one of said containers to the other; and
- means mounted on said frame for contacting said ceiling above said vehicle and said floor below to support said ceiling against collapse.

Re. 28,708
POULTRY LOADING APPARATUS AND METHOD

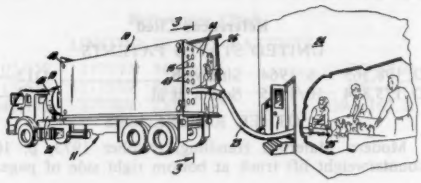
Frank N. Reynolds, Auburn, Maine, assignor to Poultry Transaire Systems, Inc., Lewiston, Maine

Original No. 3,683,862, dated Aug. 15, 1972, Ser. No. 107,334, Jan. 18, 1971. Application for reissue Sept. 10, 1973, Ser. No. 395,651

Int. Cl.² A01K *29/00, 1/00*

U.S. Cl. 119—82 52 Claims

1. A method for loading and carrying a plurality of poultry comprising the step of applying a sucking force to a mobile compartment having a generally air tight body, extending a hose into a first opening into one portion of such compartment to the presence of a bird, causing a vacuum through another opening removed from said first opening in said compartment, sucking said bird into said compartment through said hose, and repeating the step of sucking birds into different portions of said compartment until a selected number of birds have been sucked into said compartment.



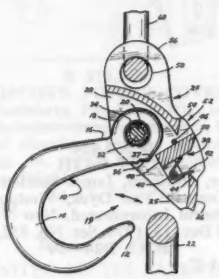
Re. 28,709
SAFETY HOOK

Edward J. Crook, Jr., Tulsa, Okla., assignor to American Hoist & Derrick Company, St. Paul, Minn.

Original No. 3,741,600, dated June 26, 1973, Ser. No. 167,371, July 30, 1971. Application for reissue Jan. 16, 1975, Ser. No. 541,389

Int. Cl.² B66C *1/36*

U.S. Cl. 294—82 R 3 Claims



1. In a safety hook, the combination with:
- a hoisting hook having a curved, load engaging, uniplanar, body portion extending to a tip at a first end thereof and through a relatively straight shank segment to a hook eye at a second end thereof, said hook having an open throat between said tip and said eye;
- a one piece safety gate having parallel side plates removably pivotally mounted through said hook eye, said gate including a connecting arm and a gate arm, each integral with and extending outwardly from said side plates in obtuse angular relation to each other;
- said gate being rotatable concentric with *hook eye* [eye opening] between a first position wherein said gate arm is positioned across said throat and in contact with said tip and a second position wherein said gate arm lies in clearing relation to *provide* access to said hook throat, an edge of said gate arm adjacent the hook throat when the gate is in said first position being in approximate alignment with an interior edge of said shank segment when said gate is in said second position [.];
- said connecting arm being provided with an eye for receiving a hoisting line, and the curved body portion of the hoisting hook being adapted to receive a load bearing

line, the relationship of the parts being such that when the safety hook is supported on a hoisting line and supports a load line and the gate is in said first position, the axis of the hook eye will lie in offset relation to a load bearing axis extending between said lines, said offset being in direction toward said hook tip; [and]

releasable latch means operative when said safety gate reaches said first position to lock it in said *first* position [.] ;

said hook eye being provided with integral latch engaging means;

said gate arm being provided with a latch receiving cavity extending transversely therethrough but lying in the plane of the hook; and

said latch means including a latch resiliently urged by resilient means into contacting, locking relation with said latch engaging means when said gate reaches said first position, said latch including a latch actuating arm lying entirely within said gate arm when in latching position and accessible through said latch receiving cavity for manual actuation against said resilient means to move said latch into spaced relation with respect to said latch engaging means.

Re. 28,710

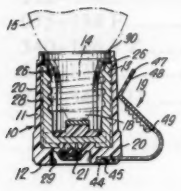
ELECTRICAL HARNESS WITH MOLDED SOCKETS

Laurence Stephen Finkelstein, 42 Lyncroft Road, Montreal, Quebec, Canada

Original No. 3,716,818, dated Feb. 13, 1973, Ser. No. 100,342, Dec. 21, 1970. Application for reissue Mar. 18, 1974, Ser. No. 452,115

Int. Cl.² H01R 9/08

U.S. Cl. 339—97 L **5 Claims**



4. An electrical lamp socket for lamp bulbs having a screw base, said lamp socket comprising a hollow cylindrical body having an open end and closed at the opposite end by a socket base integrally moulded with said cylindrical body, an electrical cable having two insulated conductor wires, said cable being moulded within said socket base, a center metallic contact having a contacting portion disposed substantially at the center of the inner face of said socket base, a retaining base portion integrally formed with said contact surface and moulded within said base to rigidly secure said center contact in said lamp socket and a point in the lower edge of said retaining base portion and penetrating said cable to contact one of said two wires, a metallic side contact of generally U-shape configuration having two opposed vertical sides and a connecting base, said side contact being partly embedded within said hollow cylindrical body and having undulations in the inner edge of each of said opposed vertical sides to engage and retain the screw base of a lamp bulb in said hollow cylindrical body spaced from the inner face of said body, a point integrally formed in the lower edge of said connecting base of said side contact and also penetrating said cable to contact said other one of said two wires, said socket base having at least two ventilating holes extending therethrough to provide ventilation about said screw base from said cylindrical body open end and through said base portion, said two ventilating holes being positioned one on a respective side of said metallic side contact.

Re. 28,711

PROCESS FOR PRODUCING BORON NITRIDE FELT

Theodore B. Selover, Shaker Heights; Robert A. Rightmire, Northfield, and Philip R. Regan, Mayfield Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Original No. 3,816,242, dated June 11, 1974, Ser. No. 244,869, Apr. 17, 1972. Application for reissue Oct. 30, 1974, Ser. No. 519,078

Int. Cl.² D21H 5/18

U.S. Cl. 162—157 R **4 Claims**

1. A process for producing a thin, flexible, integral boron nitride felt comprising the following steps:

A. purifying boron nitride fiber by washing with water and subsequently extracting with an aliphatic alcohol containing from one to three carbon atoms;

B. forming a mat from the fibers in step (A) and incorporating therein an aqueous solution of a binder [in an amount such that the final concentration of the said binder in the mat ranges from about 2×10^{-2} to about 5.5×10^{-1} g/cm³], said binder being an inorganic salt selected from the group consisting of water soluble halides, nitrates, nitrites and carbonates of the alkali metals, the alkaline earth metals, the Group III A metals, and their mixtures; and

C. drying the resulting binder-containing mat obtained from step (B) at a temperature below the melting point of the salt.

PLANT PATENTS

GRANTED FEBRUARY 10, 1976

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

3,830

PHILODENDRON PLANT

Robert H. McColley, P.O. Box 17126, Orlando, Fla. 32810

Filed Nov. 1, 1974, Ser. No. 520,105

Int. Cl. A01h *5/00*

U.S. Cl. Plt.—88 **1 Claim**

There is disclosed a philodendron plant characterized by its resistance to wilting in low moisture and high temperature conditions form retention and slow growth indoors, thick, rubbery, generally extremely small lanceolate shaped leaves which are dark grayish green, and the petioles and stems dark red.

PATENTS

GRANTED FEBRUARY 10, 1976

ERRATA

For CLASS	See PATENT NO.
303-021 BE	3,936,841
036-032 R	3,936,956
073-003	3,937,048
073-006	3,937,049
073-425.4 R	3,937,091
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214-152	3,937,167
015-042	3,937,174
124-011 R	3,937,191
144-028.5	3,937,239
162-212	3,937,273
339-097	3,937,403
172-059	3,937,460
180-033 R	3,937,484
298-011	3,937,502
312-204	3,937,537
075-134 F	3,937,628
340-146.3 Z	3,938,186
340-172.5	3,938,187
340-347 AD	3,938,188

PATENTS

GRANTED FEBRUARY 10, 1976

GENERAL AND MECHANICAL

3,936,886

TROUSERS

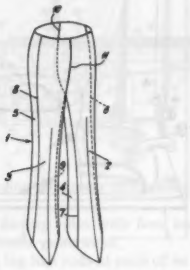
Raymond Zaoui, 17 rue Le Vau, Paris, France

Filed June 3, 1974, Ser. No. 475,989

Claims priority, application France, Oct. 19, 1973, 73/37371

Int. Cl.² A41D *1/06*

U.S. Cl. 2—227 **4 Claims**



1. Trousers adapted to prevent twisting of the trouser legs and prevent bulges near the lower point of the fly, comprising:

a. front panels and back panels, each of said front and back panels formed by an inside longitudinal edge, a waist edge, an outside longitudinal edge, and a panel base at the bottom of the trouser leg;

b. said front panel inside edge having a fly slit below the waist edge and a lower point of said fly slit;

c. said front panel outside edge having a convexity below said waist edge;

d. said back panel inside edge having a bottom point below said waist edge;

e. said back panel outside edge having a convexity below said waist edge;

f. a relationship between the inside and outside longitudinal edges of said front and back panels such that when superimposed upon one another, said front and back panel bases exactly superimpose, the inside edge of the back panel between the bottom point and panel base exactly superimposes with the inside edge of the front panel between the lower point and panel base, the outside edge of the back panel between the back panel convexity and panel base, exactly superimposes with the outside edge of the front panel between the front panel convexity and panel base, and the back panel convexity projects beyond the front panel convexity; and

g. inside lateral seam lines being formed by a connection of said front and back panel inside edges, and outside lateral seam lines being formed by a connection of said front and back panel outside edges.

3,936,887

ARTIFICIAL IMPLANT AND METHOD OF MAKING SAME

Milton Hodosh, 145 Whitmarsh St., Providence, R.I. 02907

Filed Dec. 10, 1973, Ser. No. 423,585

Int. Cl.² A61C *13/08* ; A61F *1/00*; C08K *3/04*

U.S. Cl. 3—1 **6 Claims**

1. An artificial implant comprising a composition consisting essentially of vitreous carbon and polymethylmethacrylate, said vitreous carbon comprising between ¼ of 1% and 50% of the composition by weight, said vitreous carbon being in the form of microballoons.

3,936,888

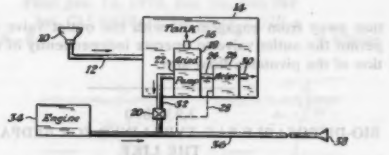
EFFLUENT DISPOSAL SYSTEM

Paul A. Sturtevant, 3880 W. Riverside Drive, Fort Myers, Fla. 33901

Filed June 19, 1974, Ser. No. 480,836

Int. Cl.² E03D *11/02*

U.S. Cl. 4—10 **1 Claim**



1. An effluent waste disposal system utilized in combination with a conventional internal combustion engine having an exhaust manifold communicating with said engine by exhaust conduits an exhaust pipe connected to said manifold, an intake manifold, a carburetor, a mixing chamber disposed between said intake manifold and said carburetor, comprising:

effluent collection tank, said tank having an input and an output;

means connected to said tank for macerating said effluent within said tank;

a pressure sensing means having an input and an output, said input connected to said mixing chamber of said internal combustion engine;

effluent flow, pressure activated metering means connected to the output of said collection tank for regulating the quantitative volume flow of effluent from said tank as a function of pressure, the output of said pressure sensing means connected to said metering means; and

a thermally conductive effluent discharge conduit disposed within said exhaust manifold in the direction of the longitudinal axis of said exhaust manifold, positioned adjacent the exhaust conduits of said engine and having a discharge opening within said exhaust manifold, the input of said discharge conduit connected to the output of said effluent flow metering means whereby the meter flow discharge volume varies as a function of the pressure of said mixing chamber such that the maximum volume output of said effluent tank is achieved at the lowest absolute pressure in said mixing chamber.

3,936,889

TOILET FLUSH MECHANISM

Tab Wibroe, Sunnyvale, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

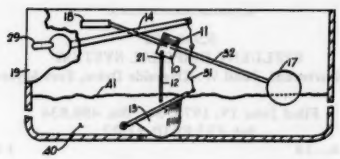
Filed Aug. 13, 1974, Ser. No. 496,980

Int. Cl.² E03D *1/14*

U.S. Cl. 4—37 **1 Claim**

1. A toilet flush tank mechanism which alternately provides means to permit a limited flush of the attached toilet or a full tank flush of an attached toilet, upon actuation of the mechanism, said tank fitted with a water supply valve controlled by a pivotable arm on which a float is fastened, which pivotable means is attached to the said pivotable float arm, which pivotable means in a first position serves to engage the outlet valve of the toilet tank mechanism, when the outlet valve is in the open position and the float arm has descended from its initial

position, with further descent of the float arm serving to force said means to push the outlet valve into the closed position, in which the pivotable means may be rotated to a second position away from engagement with the outlet valve so as to permit the outlet valve to operate independently of the position of the pivotable float arm.



3,936,890

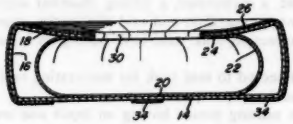
BIO-DISPOSABLE BAG-TYPE LINER FOR BEDPANS AND THE LIKE

Nathan Oberstein, 55 Knolls Crescent, Bronx, N.Y. 10463

Filed May 6, 1974, Ser. No. 467,609

Int. Cl.² A61G 9/00; A47K 11/02

U.S. Cl. 4—112 **5 Claims**



1. A bag-type liner for bedpans comprising a body adapted to be positioned within a bedpan and covering the interior thereof, said body including an outwardly extending edge portion adapted to overlie and cover the inwardly extending flange on a bedpan, and anchoring means on the outwardly extending edge portion for engaging the bedpan for securing the liner thereto, said body including the outwardly extending edge portion and the anchoring means thereon being constructed of bio-degradable material to enable the liner and its contents to be flushed into a sewage system without clogging, said body and outwardly extending edge portion being folded into a generally planar condition for storage and for initial insertion into the interior of a bedpan with the body being folded by the provision of a plurality of radially extending overlapping creases defining an accordian fold structure which facilitates peripheral enlargement of the body into conformity with the interior of a bedpan when extended.

3,936,891

SHOWER SPRAY MASSAGE-SAUNA

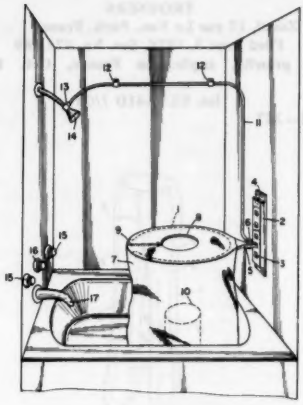
Harry H. Kulde, 21851 Newland St. No. 248, Huntington Beach, Calif. 92646

Filed Oct. 11, 1973, Ser. No. 405,685

Int. Cl.² A47K 3/22; A61H 33/06

U.S. Cl. 4—145 **5 Claims**

1. In a shower spray massage sauna for use in a bathroom comprising, in combination, a diverter valve installed between a shower head and a shower arm pipe, means introducing hot water from the shower arm pipe to the diverter valve by manipulating shower water control valves associated therewith, means directing hot water through the diverter valve and the connecting hose to said spray arm pipe means, said hose connects the diverter valve to the spray arm pipe means, said spray arm pipe means supports a body enclosing cover and is located inside said cover, means introducing the hot water spray under the cover, means combining inside the cover the force from the water for massage and the hot water spray for sauna, said cover adapted to assume a use or a non-use position, said spray arm pipe means supported and held in either position by a mounting mechanism attached to the wall, and in the use position a seat is placed inside the body enclosing cover.



3,936,892

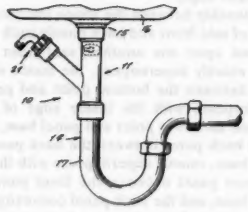
MULTI PURPOSE CLEAN-OUT ATTACHMENT

Fredrick A. Miller, 2400 El Camino Real, Mountain View, Calif. 94040

Filed Sept. 26, 1974, Ser. No. 509,414

Int. Cl.² E03D 11/00

U.S. Cl. 4—255 **2 Claims**



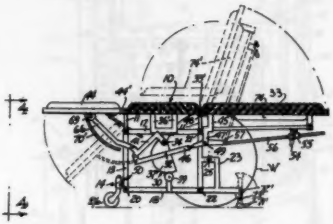
1. A multi purpose clean-out attachment for a drain system comprising a fitting having a length of pipe with means at opposite ends thereof for connection to the drain system and a branch line pipe composite therewith and angularly disposed one end thereof to said length of pipe at an acute angle with one end of said length of pipe and having means at the free end of said branch pipe remote from said length of pipe for connection to a garden hose, a first integrally mounted manually controllable valve cock with the valve portion mounted within said one end of said length of pipe, and a second integrally mounted manually controllable valve cock with the valve portion mounted within said free end of said branch pipe whereby a drain system in which said clean-out attachment is connected can be cleaned out by closing said first valve cock, opening said second valve cock and directing water through said branch pipe from a garden hose into the length of pipe.

3,936,893

ELEVATOR MEANS FOR THE CHAIR SEAT OF A CONVERTIBLE WHEEL CHAIR AND BED

Martha A. Anderson, and Robert M. Anderson, both of 443 Century Drive, Campbell, Calif. 95008

Filed July 22, 1974, Ser. No. 490,396
Int. Cl.² A61G 01/02
U.S. Cl. 5—81 R 7 Claims



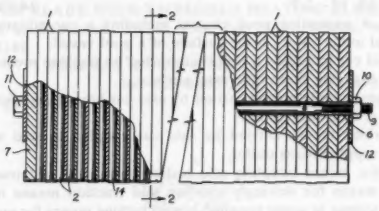
1. An invalid transferring apparatus comprising in combination:
a. a wheeled frame having sides with fore and aft corner posts providing tubular guideways;
b. a chair seat having leg-like rods at each of its four corners disposed in a respective corner post of said frame for guided up and down movement relative to the latter;
c. a cam shaft journaled transversally of said frame on the underside and in spaced relation to said chair seat;
d. support rollers mounted on said frame and adjacent each side wall thereof;
e. a cam wheel secured to each end of said camshaft and having their cam edges supported on said support rollers; and
f. lever means on said cam shaft for turning the latter to thereby change the position of said cam wheels, relative to said support rollers and effect a raising and lowering of said chair seat relative to said frame.

3,936,894

ARTIFICIAL NEST FOR HATCHING BEES

Theodore C. Barber, P.O. Box 5, Orovada, Nev. 89425

Filed Nov. 7, 1974, Ser. No. 521,653
Int. Cl.² A01K 47/04
U.S. Cl. 6—11 4 Claims



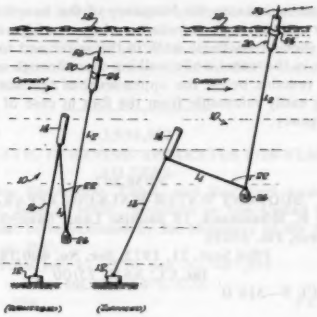
1. A nesting structure for wild bees, comprising:
a plurality of parallel engaging wooden boards forming a stack;
a plurality of parallel grooves formed in one side surface of each board running from one side edge of the board to an opposite side edge in the direction of the wood grain;
wherein the remaining side surface of each board is planar and ungrooved with each grooved surface resting against a planar side of an adjacent board to form a plurality of closed channels opening at opposite ends of the stacked boards;
an aperture formed through each board from the grooved surface to the planar surface forming an open bore extending through the stack;
a supporting rod received through the open bore with ends protruding from the stack;
spring clamp bars at the rod ends for engaging the stack at opposite ends thereof; and
means on the rod for deflecting the spring clamp bars against the stack ends to secure the boards therein.

3,936,895

BENTHIC BOBBING BUOY

Howard R. Talkington, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 14, 1975, Ser. No. 540,781
Int. Cl.² B63B 21/52; G01F 23/10
U.S. Cl. 9—8 R 6 Claims



1. A benthic bobbing buoy system comprising:
an anchor;
a buoy;
an anchor line connecting the buoy to the anchor;
said anchor line being of a length to establish the buoy in a submerged position;
another buoy for bobbing between the surface of the water and a submerged position;
a bobbing line connecting the bobbing buoy to the submerged buoy;
a weight connected to the bobbing line intermediate its ends for limiting the descent of the bobbing for cooperating with said bobbing buoy for forming a bobbing buoy-weight system buoy when the bobbing buoy-weight system is negatively buoyant;
means for selectively changing the buoyancy of the bobbing buoy-weight system between a positively buoyant condition to a negatively buoyant condition;
the length of the bobbing line between the submerged buoy and the weight means being represented by L_1, and the length of the bobbing line between the weight means and the bobbing buoy being represented by L_2; and
L_2 being greater in length than L_1 so that during all positions of the bobbing buoy tension is maintained on all of the lines to prevent entanglement thereof.

3,936,896

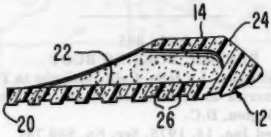
BUOYANT SHOE

Adelene Creamer, 137 Palmer Ave., Mountain View, Calif. 94040

Continuation of Ser. No. 877,351, Nov. 17, 1969, abandoned.
This application June 5, 1972, Ser. No. 260,006
Int. Cl.² A63C 15/00
U.S. Cl. 9—310 D 1 Claim

1. An article of footwear to be loosely worn directly on the foot in a body of water comprising: a backless, strapless shoe

having an upper and a sole integral with each other, the rear margin of the sole defining the rearmost structure of the shoe, said upper being spaced forwardly of said rear margin, said upper and said sole defining a space for receiving the front part of the foot, said upper and sole being formed from a lightweight, buoyant, expanded plastic material in sufficient



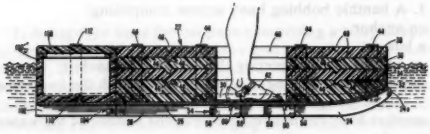
amount to increase the buoyancy of the wearer in a body of water and to permit the wearer, when wearing a second, identical shoe to floatingly walk in the water and to bob up and down in the water while walking therethrough and while the shoe remains below the upper level of the water said shoe being easily releasable from the foot in case of the wearer's emergency.

3,936,897

BUOYANT WATER-WALKING APPARATUS

Peter H. Schaumann, 15 Jasmine Lane, Spanish Lakes, Fort Pierce, Fla. 33450

Filed Sept. 21, 1973, Ser. No. 400,193
Int. Cl.² A63C *15/00*
U.S. Cl. 9—310 D **19 Claims**



1. Buoyant water-walking apparatus including a pair of elongated buoyant water-walker assemblies adapted for attachment to the feet of a user, each of said assemblies comprising:

a rigid, elongated base member comprising a longitudinally extending central web section having lateral edges and a pair of longitudinally extending flange sections attached respectively to a corresponding edge of the web section and extending generally normally away from the latter in the same direction to present laterally spaced keels;

at least one buoyant flotation member carried by said web section on the opposite side thereof from the direction of extension of the flange sections, said flotation member being generally coextensive in length and width with said web section and having an opening extending therethrough in a direction which is generally normal to the major plane of the web section, said opening being adapted for receiving the foot of a user of the apparatus therein;

said base member has a generally H-shaped transverse cross-sectional configuration presenting said web section and said keels, and also presenting a pair of wall sections extending in the opposite direction from said keels, said flotation member being disposed between said wall sections; and,

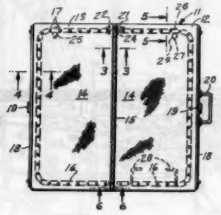
means detachably securing said flotation member and said base member together to present said assembly.

3,936,898

PORTABLE RAMP FOR WHEEL CHAIRS

Alice Poe, 10330 Outlook Drive, Leawood, Kans. 66207

Filed May 5, 1975, Ser. No. 574,303
Int. Cl.² E01D *15/12*
U.S. Cl. 14—72 R **3 Claims**



1. A portable ramp for wheelchairs, comprising a pair of hinged together and rectangular configurated plates with flange means so as to prevent said wheelchair from rolling off the side edges of said ramp, a pair of U-shaped tubular members secured to one side of said plates, a pair of spaced apart leg members secured one each to said tubular members, a pivotable latch strap member secured to one of said tubular members, handle grip means secured to one of said flanges and snap latch means secured one portion each to said flange members, a pair of rotatable hook members secured to said platform providing depending means for said portable ramp from the rear of said wheelchair.

3,936,899

AUTOMATIC SWIMMING POOL CLEANER

Melvyn L. Henkin, 19640 Greenbriar Drive, Tarzana, Calif. 91356, and Jordan M. Laby, 3940 Davana Road, Sherman Oaks, Calif. 91403

Division of Ser. No. 275,173, July 26, 1972, abandoned. This application Mar. 7, 1974, Ser. No. 448,817
Int. Cl.² F04H *3/20*
U.S. Cl. 15—1.7 **24 Claims**

1. A swimming pool cleaner including a car adapted to travel underwater on the surface of a pool vessel;

said car including a frame supported on traction means for engaging said pool vessel surface;

water supply means carried by said car having an inlet and at least one outlet;

turbine means carried by said car coupled to said water supply means outlet;

drive means coupling said turbine means to said traction means for drivingly rotating said traction means in response to water supplied to said turbine means for propelling said car along said vessel surface;

thrust means carried by said car for producing a water flow having a component directed to produce a reaction force on said car acting to thrust said traction means against said pool vessel surface;

debris container means and debris suction means carried by said car;

said debris container means including an entrance opening;

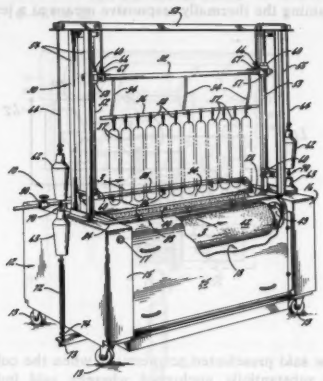
said debris suction means including a suction entrance located on said car in close proximity to said vessel surface and a suction exit coupled to said debris container means entrance opening.

3,936,900

SAUSAGE BRUSHING APPARATUS

Miklos Bende, 17 Fairview Court, Clarendon Hills, Ill. 60514

Filed Mar. 12, 1975, Ser. No. 557,636
Int. Cl.² A46B 13/04
U.S. Cl. 15—3.12 9 Claims



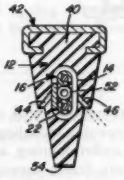
1. Apparatus for brushing encased sausages and the like to remove encrusted materials therefrom comprising, in combination, an enclosed housing having a chamber therein, means defining an elongated opening on the upper surface of the housing leading to the chamber, upright support means disposed above said housing including a vertically movable transverse member means for suspending a plurality of said encased sausages above said housing opening adapted to move said suspended sausages into the housing through said opening, means including a pair of elongated brushes disposed within the housing chamber and beneath the housing opening, the axes of said brushes being generally parallel and skewed with respect to one another, and means for counter-rotating said brushes at predetermined speeds and directions so that encased sausages suspended from said vertically movable transverse member means upon downward movement thereof pass between the rotating brushes and the sausages are rotated about their own axes by and during the brushing action thereon.

3,936,901

WIPER BLADE WITH EMBEDDED HEATING ELEMENT

Dana L. Theckston, 16440 15th Ave. S.W., Seattle, Wash. 98166

Filed Sept. 17, 1974, Ser. No. 506,895
Int. Cl.² B60S 1/46
U.S. Cl. 15—250.04 9 Claims



1. A heated windshield wiper assembly, comprising, in combination:

a. a heat resistant flexible blade element having an internal cavity arranged for receiving water; and

b. electrical heating means encased in the blade element for uniformly distributing heat throughout the blade element and heating water in the cavity, the heating means including:

i. a resistance element;

ii. coupling means for establishing a grounded electrical connection to the resistance element, the heating means further including a heat distributing element in the form of a flexible, tubular member encased in the blade element and constructed from a non-conductive material, the tubular member arranged extending in a folded condition along the length of the blade element for flexing therewith, the heating means still further including a nonconductive coil means encircling the tubular member in folded condition for holding the tubular member in its folded condition and assuring uniform distribution of heat transferred from the resistance wire throughout the blade element, the coil means being completely encased in the blade element; and

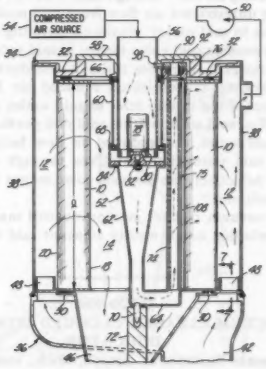
c. a plurality of holes provided in the blade element, the holes being arranged communicating with the cavity along coextensive sides of the blade element, water being fed from the tube into the cavity in the blade element for exiting through the holes.

3,936,902

AUTOMATIC CLEANING APPARATUS FOR FLUID FILTERS

Michael Allen Shackleton, Edina, and Roy Earl Anderson, Burnsville, both of Minn., assignors to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1974, Ser. No. 487,835
Int. Cl.² A47L 5/38
U.S. Cl. 15—304 3 Claims



1. In a dust removal apparatus comprising an annular filter element having an axial length "1"; a tubular air flow nozzle structure extending along and closely adjacent to a perimeter surface of the filter element for the full axial length 1; said nozzle structure comprising a port forming means facing the perimeter surface of the filter element, said port forming means having an axial dimension substantially less than the filter element length 1; means to move flushing air through the nozzle structure so that the port forming means removes dust build-ups from the filter element; first means to move the port forming means in a direction parallel to the filter element axis; and second means to move the port forming means circumferentially around the filter element surface:

the improvement wherein the second moving means operates continuously to produce a relatively slow uninter-

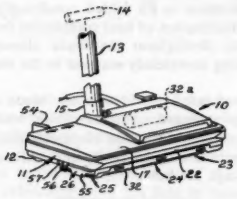
rupted circumferential motion of the port forming means, and the first moving means operates only at the end of each complete revolution of the port forming means to produce a relatively quick step-like axial indexing of said port forming means.

3,936,903

VACUUM CLEANER SUCTION TOOL

Robert Edward Johnson, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 3, 1974, Ser. No. 475,972
Int. Cl.² A47L 9/00
U.S. Cl. 15—331 **13 Claims**



1. In a vacuum cleaner having a nozzle defining a suction passage having an inlet and an outlet, and means for sucking dirt laden air through said inlet to said outlet, said inlet of the nozzle defining a mid-portion and an edge portion, an improved means for controlling the suction of the dirt laden air through said inlet portions comprising: duct means extending from said edge portion of the nozzle inlet to said outlet; valve means at said outlet selectively movable between a first position and a second position, said valve means in said first position restricting air flow through said duct to said outlet while permitting unrestricted air flow from said mid-portion of the nozzle inlet to said outlet; means cooperating with said valve means for causing said valve means in said second position to permit unrestricted air flow through said duct while concurrently providing a preselected reduced air flow from said mid-portion of the nozzle inlet to said outlet and preventing full shutoff of said air flow from said mid-portion of the nozzle inlet to said outlet, said reduced air flow being substantially less than said unrestricted air flow through said duct; and means for selectively moving said valve means to said first and second positions.

5. The vacuum cleaner suction control means of claim 1 further including comb means adjacent said inlet edge portion.

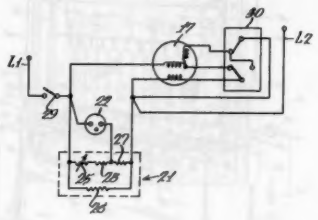
3,936,904

VACUUM CLEANER CLOGGED CONDITION INDICATOR

Larry Thomas Bashark, St. Joseph, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 3, 1974, Ser. No. 475,974
Int. Cl.² A47L 9/28
U.S. Cl. 15—339 **11 Claims**

1. In a vacuum cleaner having an air suction means including drive means, collecting means for removing entrained material from air flowed therethrough by said suction means, and means for conducting said air in heat transfer association with the drive means for cooling the drive means, means for indicating an undesirable clogging of the collecting means comprising: electrically operable indicator means carried by said vacuum cleaner; thermally responsive means for operating said indicating means when the thermally responsive means is heated to above a preselected temperature including a positive temperature coefficient resistor electrically connected to said indicator means for varying the effective voltage applied thereto; heater means having a preselected heating capacity for heating said thermally responsive means to above said preselected temperature; and thermally conductive means mounting said heater means and thermally responsive means in heat transfer association, at least one of said heater means and said thermally responsive means being in heat transfer association with the sucked air subsequent to its conduction in heat transfer association with said drive means for maintaining the thermally responsive means at a temperature below said preselected temperature when the collecting means is substantially unclogged whereby said indicating means is precluded from operating and thereby indicate the substantially unclogged condition of said collecting means, and permitting the heater means to heat said thermally responsive means to above said preselected temperature when the collecting means is substantially clogged whereby said indicating means is caused to operate and thereby indicate the substantially clogged condition of said collecting means.

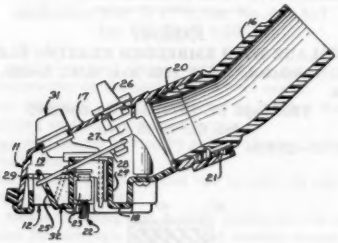


3,936,905

VACUUM CLEANER SUCTION TOOL

Bruce E. Stewart, St. Paul, Minn., and Keith E. Carr, Stevensville, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 3, 1974, Ser. No. 475,971
Int. Cl.² A47L 9/00
U.S. Cl. 15—416 **13 Claims**



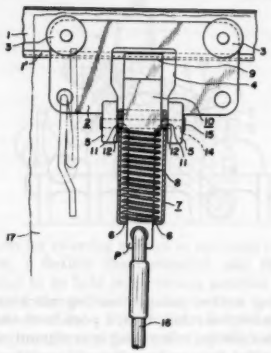
1. A vacuum cleaner suction tool comprising: a nozzle defining a suction inlet opening including a midportion and an edge portion, a suction outlet opening, and a flow passage for conducting dirt laden air drawn through said suction inlet opening mid-portion and edge portion to said outlet opening; and blocking means for selectively substantially blocking air flow through said suction inlet opening mid-portion to provide high suction force at said suction inlet edge portion, said blocking means being incapable of restricting air flow through said suction inlet edge portion.

3,936,906

CURTAIN STOPPING DEVICE

Ietsugu Takazawa, Bancho-Chidorigabu-chi Habitation 901, 3 Sanban-cho, Chiyoda, Tokyo, Japan

Filed May 21, 1974, Ser. No. 471,918
Claims priority, application Japan, May 25, 1973, 48-59196
Int. Cl.[2] A47H 5/032
U.S. Cl. 16—87.4 R 2 Claims



1. A curtain positioning assembly comprising in combination:

an elongated tubular rail for suspending draw curtains or the like,

said rail including spaced longitudinal track portions flanking a longitudinal slot;

curtain hanger means mounted on said rail and movable therealong for opening or closing the curtains, the improvement in which said curtain hanger means comprises:

a plate member having upper roller means disposed within said rail and engaged on inner surface portions of said longitudinal track portion, said plate member having a portion depending through said longitudinal slot of said rail and means for suspending a curtain therefrom; and

a brake assembly mounted on said plate portion depending through said rail slot, said brake assembly comprising a tubular sleeve anchored on said depending plate portion beneath said rail tracks, said tracks having lower surface portions for engagement with braking means, a braking member reciprocatingly disposed in said sleeve anchored on said plate member, said braking member being displacable relative to said rail and sleeve, spring means disposed in said sleeve in engagement with said braking member and constantly urging the braking member toward said rail, said braking member having braking portions constantly urged toward and engageable with the respective, spaced lower surfaces of said rail track, said braking member having a portion depending through said sleeve for connection to a tension-applying means for overcoming said spring means to permit the curtain hanger means to be readily moved longitudinally along said rail.

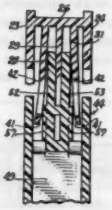
3,936,907

MOLDED HINGE CONSTRUCTION

Eric G. Jansons, Schaumburg, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed Mar. 19, 1975, Ser. No. 559,840
Int. Cl.[2] E05D 1/06, 15/50, 5/02
U.S. Cl. 16—171 6 Claims

1. A molded hinge construction comprising first and second cooperating components molded from a plastic composition material, the first component including a pair of spaced parallel ribs integral with a transversely extending web, an intermediate rib integral with said web and disposed intermediate and in spaced relation to said parallel ribs, each of said parallel ribs having a circular opening with said openings being in coaxial registration, the second component including a pair of spaced



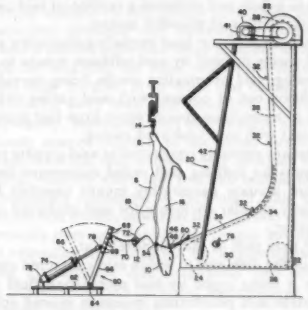
ears, each having on its outer surface a circular boss with said bosses being in coaxial registration and journalled in respective circular openings, said ears being received in respective spaces between said parallel and intermediate ribs with the intermediate rib being received between said ears.

3,936,908

HIDE PULLING METHOD AND APPARATUS

Frank M. Cook, San Mateo, Calif., assignor to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio

Division of Ser. No. 304,386, Nov. 2, 1972. This application Apr. 2, 1975, Ser. No. 564,202
Int. Cl.[2] A22B 5/16
U.S. Cl. 17—21 7 Claims



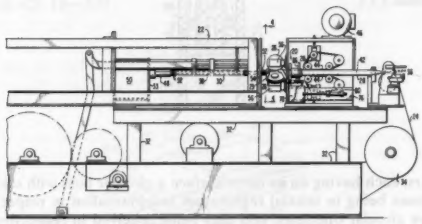
1. Apparatus for removing the hide from a meat carcass having the hide slitted lengthwise of the belly, the hide being partially detached from the carcass to provide side flaps disposed along opposite sides of the carcass, said apparatus comprising: a conveyor suspending the prepared carcass from at least one hind leg with the head and forelegs lowermost; a primary hide puller including means to grip the side flaps at opposite sides of the suspended carcass and forcibly pull the side flaps in a common direction toward and beyond the spine of the suspended carcass; and a secondary puller including means to grip the forelegs and forcibly pull said forelegs in a direction substantially opposite to the direction of pull applied to the side flaps by said primary hide puller.

3,936,909

APPARATUS FOR SEVERING THIN TUBING MEMBERS

Clarence F. Carter, Danville, Ill., assignor to Carter Engineering Company, Danville, Ill.

Filed Jan. 23, 1974, Ser. No. 435,772
Int. Cl.[2] A22C *11/02*
U.S. Cl. 17—42 32 Claims



26. An apparatus for severing a length of shirred casing for prepared meat from unshirred casing, said apparatus comprising:

mandrel means for receiving the shirred casing thereabout;

inflation means for introducing a pressurized fluid into an interior of said casing disposed around said mandrel means to inflate and maintain a portion of said casing out of contact with said mandrel means;

penetrating means for at least partially penetrating a portion of said casing inflated by said inflation means to weaken said casing, said penetrating means being movable from a condition out of contact with said casing radially inwardly to a condition spaced apart from said mandrel but in contact with said unshirred casing;

limiting means operably connected to said arcuate penetrating means for limiting said radial movement thereof so that said arcuate penetrating means together form an essentially circular enclosure for said unshirred casing of a diameter;

greater than that of said mandrel, but

less than the diameter to which said contacted circumference is being urged by said pressurized fluid so as to maintain said penetrating means in spaced apart relation to said mandrel and in constricting relation to said unshirred casing;

first engaging means for engaging a portion of said shirred casing;

second engaging means for engaging a portion of said unshirred casing; and

displacing means cooperating with said penetrating means for displacing said first engaging means relative to said second engaging means to exert longitudinal tensioning forces on said unshirred casing to:

maintain said unshirred casing substantially out of contact with said mandrel,

force said unshirred casing against said penetrating means while said unshirred casing remains in substantially continuously spaced apart relation to said mandrel, and

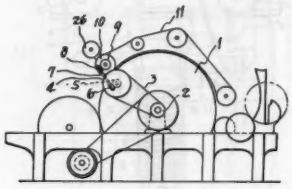
overstress said weakened portion of said casing to sever a length of shirred casing from said unshirred casing.

3,936,910

CARDING METHOD AND MACHINE

Toyozo Tanaka; Shigeyoshi Kubota, and Masao Kunieda, all of Yamatotakada, Japan, assignors to Unitika Limited, Osaka, Japan

Filed Apr. 29, 1974, Ser. No. 464,958
Claims priority, application Japan, Apr. 28, 1973, 48-194
Int. Cl.[2] D01G *15/08*
U.S. Cl. 19—102 12 Claims



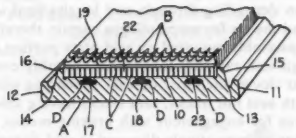
1. A carding method using a carding machine having a cylinder and a loop of rotary flats, a portion of which loop is opposed to the cylinder, comprising intermittently driving the flats with repetitive drive and stop intervals, and feeding a unit length of flats on each drive interval less than the length of said portion of the loop of flats.

3,936,911

METALLIC FLAT CLOTHING

Marion Winifred Roberts, Greenville, S.C., assignor to John D. Hollingsworth on Wheels, Inc., Greenville, S.C.

Filed Oct. 7, 1974, Ser. No. 512,451
Int. Cl.[2] D01G *15/24*
U.S. Cl. 19—113 2 Claims



1. A flat strip having metallic card clothing for use on a flat top card comprising:

an elongated base strip having a longitudinal channel therein extending the length thereof for receiving metallic card clothing transversely therein;

said metallic card clothing including a plurality of segments of wire each having a base carrying upstanding teeth adjacent one edge thereof;

a plurality of spaced substantially vertical passageways extending entirely across a vertical side surface of said base of each of said segments;

said segments being stacked in aligned relation transversely of said channel with each base abutting a next succeeding base forming aligned rows of teeth extending transversely across and projecting above said base strip;

an adhesive substantially filling said vertical passageways affixing each strip to the next succeeding strip and to the base strip; and

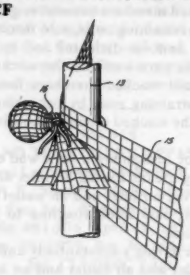
at least one open longitudinal slot in a base of said channel forming a reservoir for receiving adhesive having been poured over said segments and flowing through said vertical passageways attaching said segments to said base strip.

3,936,912

DEVICE AND SYSTEM FOR TIE-DOWN

Bill Flanagan, Jr., Houston, Tex., assignor to Griffolyn Company, Inc., Houston, Tex.

Filed May 28, 1974, Ser. No. 473,563
Int. Cl.² A44B 21/00; A45F 1/16
U.S. Cl. 24—73 CF 5 Claims



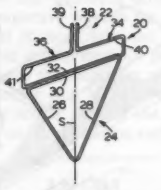
1. A system for covering articles or openings comprising, in combination, a flexible sheet material, said sheet material being adapted to be held in protecting position by a binding means secured thereto, said binding means having two end portions connected by a flexible link such that the end portions can be brought together by flexing the link causing the latter to form a loop, the end portions each being substantially larger than the part of the link adjacent thereto, said sheet material enveloping the end portions with the latter being brought-together as aforesaid, and securing means engaging the sheet material at the juncture between the brought-together end portions and the link to hold the sheet material in enveloping position around said end portions, said link being flexible throughout its length and resiliently stretchable lengthwise.

3,936,913

CLIP FOR T-BAR CEILING STRUCTURES

Sydney Joseph Weissman, 49 Apollo Drive, Don Mills, Ontario, Canada

Filed Apr. 7, 1975, Ser. No. 565,504
Int. Cl.² A44B 21/00; E04G 17/18
U.S. Cl. 24—73 C 5 Claims



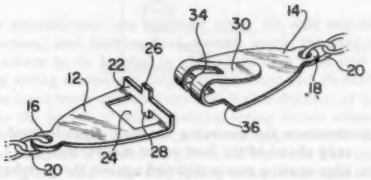
1. A clip for use in suspending an article from a T-bar ceiling structure which includes a plurality of T-bars each having an upright stem and a bottom limb defining oppositely directed lateral portions, wherein the clip is symmetrical about a longitudinal line of symmetry and is made of a single length of rigid wire shaped to define an upper portion for engagement with one of said T-bars in use, and a lower portion for engagement by an article to be suspended from the T-bar, wherein the lower portion of the clip defines the general shape of an inverted isosceles triangle arranged with its base transverse to said line of symmetry and includes: two inclined sections angularly disposed with respect to said line of symmetry and extending along the inclined sides of said triangle; and two transverse sections extending generally parallel to one another generally along the base of the triangle and each joined at one end to a respective one of said inclined sections: and wherein the upper portion of the clip defines two angled sections each joined at one end to the opposite end of a respective one of said transverse sections, said angled sections including: respective portions at the ends of said length of wire, said end portions being positioned generally parallel to and closely adjacent said line of symmetry and projecting outwardly of the clip; and respective rectilinear portions which extend outwardly from said end portions transverse to said line of symmetry, whereby when the clip is fitted to a T-bar in use, said end portions lie against respectively opposite sides of the stem of the T-bar and said rectilinear portions extend across the upper surfaces of said lateral portions of the bottom limb of the T-bar.

3,936,914

SEPARABLE FASTENER

William A. Mancini, 49 Galileo Ave., Providence, R.I. 02908

Filed Apr. 7, 1975, Ser. No. 565,759
Int. Cl.² A44B 17/00, 13/00
U.S. Cl. 24—201 BN 6 Claims



1. A separable fastener adapted to releasably interconnect spaced ends of a flexible chain or the like, comprising a first plate-like body member having means at one end for receiving an end of the flexible chain, an upstanding flange extending laterally across its other end, there being a centrally positioned opening in said body adjacent said other end, said opening being bridged by said flange, said flange having centrally positioned upwardly and downwardly extending lugs thereon, and a second plate-like body member having means at one end for receiving the other end of the flexible chain, said second body member at its other end having an integral tongue extending away from said other end and then gently curving upwardly, rearwardly and downwardly and terminating in closely spaced relation to the upper surface of said second body member, said tongue being of lesser width than said opening, whereby when said first and second body members are releasably connected to each other, said tongue extends beneath said flange, upwardly through said opening, and then rearwardly over said flange, said tongue having an elongated slot extending from adjacent the beginning thereof and terminating intermediate said rearwardly and downwardly extending portion, said slot receiving therethrough the aforesaid oppositely extending lugs.

3,936,915

CLOTH FEEDING DEVICE FOR TENTERING MACHINES

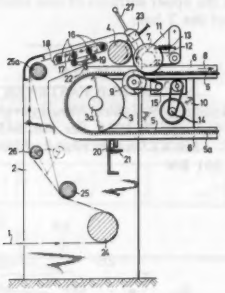
Arno Becker, Freudenstadt, Germany, assignor to Bruckner-Trockentechnik KG, Leonberg, Germany

Continuation-in-part of Ser. No. 328,606, Feb. 1, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,680
Claims priority, application Germany, Feb. 24, 1972, 2208756; July 27, 1972, 2237014
Int. Cl.² D06C 3/02
U.S. Cl. 26—57 A 10 Claims

1. A tentering machine for a cloth web, comprising a pair of endless needle chains, each having a driven needling roller cooperating therewith for impaling an edge of the web on an associated needle chain, the two needling rollers being substantially coaxial, and means for adjusting the lateral positions

of the needling chains and needling rollers associated therewith, wherein the improvement comprises

a. driven feed roller means arranged ahead of and substantially tangent to the needling rollers, and having a web-driving periphery extending substantially continuously across the width of the web, for delivering the web downwardly onto the needling rollers with substantially no intervening gap in which lateral sagging of the web can occur,



b. members for spreading the web edges located immediately ahead of the feed roller means, and

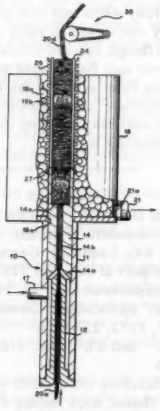
c. edge-sensing means directed against the periphery of the feed roller means, for sensing the web edges immediately after they have been spread, while the web is supported across its entire width by the feed roller means, and for controlling the means for adjusting the lateral positions of the needling chains and needling rollers associated therewith.

3,936,916

METHOD AND APPARATUS FOR THE PRODUCTION OF TEXTURED YARN

David E. Borenstein, and Charles S. Hatcher, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 9, 1974, Ser. No. 468,489
Int. Cl.[2] D02G 1/12
U.S. Cl. 28—1.6 13 Claims



1. A method comprising:

passing a yarn to be textured to a yarn texturing zone; and

passing the yarn directly to a restraining zone in which a yarn wad forms, said restraining zone containing a rigid sleeve, a plurality of individual stacked members and a flexible sleeve through which the yarn wad passes, said rigid sleeve being positioned intermediate the yarn wad and the stacked members to assist in guiding the yarn wad through the restraining zone, said flexible sleeve being of substantially uniform diameter and being positioned intermediate the yarn wad and the stacked members so as to prevent said stacked members from being removed from said restraining zone by becoming entrained in the yarn wad as the stacked members confine and restrain the yarn wad.

6. Apparatus for restraining a yarn wad comprising:

a yarn texturing means having an inlet and an outlet;

a chamber having an inlet and an outlet and an inner and outer surface, said inlet attached to the outlet of the texturing means;

a flexible sleeve having a substantially uniform diameter and having an inlet and an outlet and an inner and an outer surface, said inlet of said sleeve being attached to the outlet of said texturing means and said sleeve being positioned in and extending through said chamber;

a plurality of individual stacked members positioned in said chamber between the inner surface thereof and the outer surface of said flexible sleeve; and

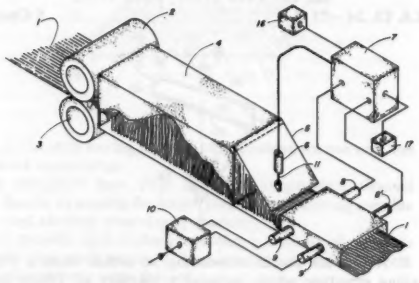
a rigid sleeve disposed in said chamber adjacent the inlet thereof and extending therethrough to form an extension of said inlet, said rigid sleeve constructed so as to permit the stacked members to pass therethrough.

3,936,917

AUTOMATIC GATE LOADING CONTROL FOR STUFFER BOX TEXTURING MACHINE

Dick Charles Vermeer, Chester, and Raymond Joseph Biron, Colonial Heights, both of Va., assignors to Allied Chemical Corporation, Petersburg, Va.

Filed May 19, 1975, Ser. No. 578,588
Int. Cl.[2] D02G 1/12
U.S. Cl. 28—1.7 20 Claims



1. In a stuffer box crimping process for synthetic yarn comprising

forcing said yarn into a crimping chamber to form a wad of said yarn in said crimping chamber, said chamber having a pressure regulated discharge means at the outlet thereof, and

discharging said yarn from said crimping chamber, and

controlling said discharge of said yarn from said chamber by regulating said pressure on said discharge means, said regulating pressure being varied in response to sensing position of said wad of said yarn at the exit of said crimping chamber and regulating said pressure with a pressure sensor controller,

the improvement comprising

sensing said position of said wad of said yarn in said crimping chamber by

issuing at least one jet of fluid, said jet aligned to issue across the exit of said crimping chamber, and

receiving said jet of fluid in an enlarged orifice communicating with said pressure sensor controller,

so that the presence of said wad of said yarn is sensed by interrupting said jet of fluid by said wad, thereby changing pressure in said enlarged orifice to regulate said discharge means through said pressure sensor controller.

3,936,918

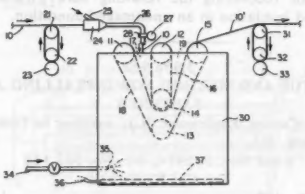
STRAND TREATMENT APPARATUS

Ralph W. List, East Lansdowne; Malcolm F. Irwin, West Chester, and Robert K. Stanley, Media, all of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Division of Ser. No. 461,976, April 18, 1974. This application Jan. 20, 1975, Ser. No. 542,443

Int. Cl.² D06C *1/06*

U.S. Cl. 28—59 **11 Claims**



1. In apparatus for setting crimped textile strands, the improvement comprising a relatively coarse conveyor screen, a relatively fine conveyor screen, rotative means constraining the respective screens for travel adjacent one another over a part of their paths, the constraining means including a yieldable arrangement for permitting accumulation of strand between the respective screens to force them apart from one another at a locus of support thereof and means for injecting setting fluid at the side of the coarse screen opposite the strand-contacting surface thereof.

3,936,919

PLURAL RANGE PRESSURE REGULATOR CONSTRUCTION OR THE LIKE AND THE METHOD OF MAKING THE SAME OR THE LIKE

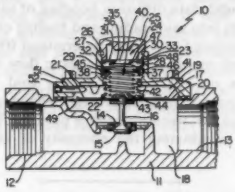
Francis S. Genbauffe, Irwin, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 320,520, Jan. 2, 1973, Pat. No. 3,825,029. This application May 16, 1974, Ser. No. 470,435

Int. Cl.² B23P *15/00*; F16K *31/12*

U.S. Cl. 29—157.1 R **5 Claims**

1. A method for making a plural range pressure regulator construction comprising the steps of providing a housing means with an inlet and an outlet separated by a valve seat and with a valve member for controlling said valve seat and being interconnected to a flexible wall carried by said housing means and controlling the movement thereof relative to said valve seat, disposing biasing means in said housing means for acting on one side of said wall to tend to move said wall in one direction relative to said housing means, said biasing means comprising a plurality of separate spring means, causing each spring means to act on said wall to provide one pressure range for said regulator construction, storing one of said spring means completely in a storage space of said housing means so that the same will not act on said wall whereby the remaining spring means acting on said wall will provide another pressure range for said regulator construction, forming said one spring means and said remaining spring means from coiled compression springs, causing said springs to be concentrically disposed and each having one end thereof operatively engaging said



wall to provide said one pressure range for said regulator construction, and forming said storage space for said one spring means to be located in aligned relation with said remaining spring means and adjacent the other end thereof so as to be completely spaced from said wall a distance at least equal to the length of said remaining spring means whereby said one spring means is out of operative engagement with said wall and completely spaced therefrom a distance at least equal to the length of said remaining spring means when said other pressure range is being provided.

3,936,920

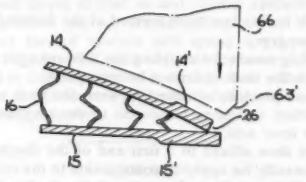
AERODYNAMIC SHELL STRUCTURE WITH FITTINGS AND METHOD FOR FABRICATING SAME

Charles E. Conn, Jr., Santa Ana, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 280,645, Aug. 14, 1972. This application May 4, 1973, Ser. No. 357,359

Int. Cl.² B23P *15/04*; B23K *31/00*

U.S. Cl. 29—156.8 B **43 Claims**



1. A method for fabricating a thin skin, internally stiffened, aerodynamic shaped shell structure having homogeneous leading and trailing edges with parent material properties comprising the steps of:

a. fabricating a panel blank comprised of metallic stiffening material disposed between and joined to first and second planar metallic face sheets, said face sheets each having a thickness dimension substantially less than its surface dimensions, the edges of each of said face sheets having in their longitudinal direction a sufficient volume of flow material thereon to achieve the required solidity of said leading and trailing edges, said volume of flow material being about 5–10 percent oversized, and said stiffening material giving to said structure the required strength and stiffness to weight ratios;

b. forming said panel blank into a basic aerodynamic shape by imparting thereto aerodynamic contours;

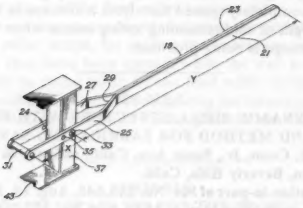
c. providing a die assembly including a die ram, said die assembly being installed within means for applying pressure and said die ram being configured to achieve the desired contours for said aerodynamic structure;
d. disposing said panel blank in said die assembly; and
e. applying a forming and joining force to said panel blank by the action of said die ram in said die assembly as pressure is applied to said die assembly in an inert atmosphere at a temperature below the transformation temperature of the metal of said panel blank for a sufficient duration to form said aerodynamic structure and to acheive solid state diffusion bonding of said edges of said face sheets into said leading and trailing edges, said forming and joining force being determined from the volumes of said flow material and the plastic flow and creep characteristics of said metal whereby said oversized flow material on said face sheet edges allows said edges to fit within said die assembly with a positive fill, thereby substantially eliminating the necessity of very close tolerances.

3,936,921

APPARATUS FOR INSTALLING COIL SPRINGS

Joseph Kenneth Ross, Rte. 2 Box 124D, Rockwall, Tex. 75087

Filed May 19, 1975, Ser. No. 578,515
Int. Cl.² B23P *19/04*
U.S. Cl. 29—227 **5 Claims**



1. An for installing or removing a compressed coil spring encircling a shaft, comprising:
a lever arm;
a fork having two tines formed at the forward end of the lever arm;
coupling means for coupling the forward ends of the tines with the shaft to form a fulcrum point;
a shank pivotally attached between the tines and having a portion extending transverse to the longitudinal axis of the lever arm;
a first shoe affixed to a first end of the shank, projecting forwardly for applying compression to the coil spring, the engaging surface of the shoe being inclined an angle α with respect to the longitudinal axis of the coupling means for mating evenly with the coils of the spring.

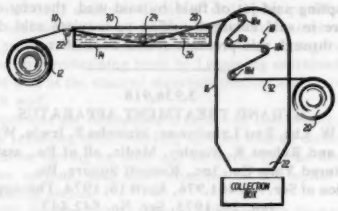
3,936,922

METHOD AND APPARATUS FOR RECOVERING INSULATION AND CONDUCTOR FROM SCRAP INSULATED WIRE

Michael Blackstone, Atlanta; Bryant K. Maddox, Carrollton; Bobby A. Rowland, Carrollton, and Stanley L. Tate, Carrollton, all of Ga., assignors to Southwire Company, Carrollton, Ga.

Division of Ser. No. 334,972, Feb. 22, 1973, Pat. No. 3,858,776. This application May 16, 1974, Ser. No. 470,474
Int. Cl.² B23P *19/04*
U.S. Cl. 29—234 **9 Claims**

1. Apparatus for continuously removing the insulating covering from the entire surface of insulated wire without damaging the wire comprising:
means for continuously feeding wire covered with a fragmentable insulation from a supply source to a recovery station;
means for continuously bending said wire and insulation along the length thereof and inducing stresses in said insulation in an amount sufficient to fracture said insulation;



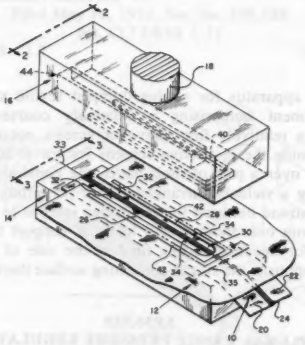
means for contacting said insulation covered wire with a refrigerant capable of rendering said insulation brittle positioned between said continuous feeding means and said continuous bending means; and
means for recovering the resulting bare wire and fragmented insulation in an undamaged condition.

3,936,923

APPARATUS AND METHOD FOR INSTALLING A SLIDE FASTENER

Charles E. Cantor, Englewood, N.J., assignor to Textron Inc., Providence, R.I.

Filed Nov. 5, 1974, Ser. No. 521,112
Int. Cl.² B29D *5/00*
U.S. Cl. 29—408 **19 Claims**



1. An apparatus for installing a slide fastener to material, the slide fastener having a pair of carrier tapes and opposed interengaged fastening elements with each one of the elements being secured to its respective one of the adjacent edges of the pair of carriage tapes, said apparatus comprising
a support block means,
a first pair of laterally spaced pins disposed at one end of said block means,
a second pair of laterally spaced pins disposed at the opposed end of said block means and spaced at a longitudinal distance less than the length of the slide fastener from said first pair of pins,
each pin of said first or second pair being laterally spaced relative to the other pin of its respective pair at a distance greater than the overall width of the interengaged elements of the slide fastener, and

said first and second pairs of pins adapted for piercing certain opposed and spaced end portions of the adjacent edges of the carrier tapes of the slide fastener so as to effect securing of the slide fastener to said first and second pairs of pins while at the same time to effect substantially flat nesting engagement of the secured slide fastener on said block means prior to attachment of the material to the slide fastener.

14. The method as set forth in claim 11 wherein an additional step includes stretching the slide fastener between its ends on the order of one-eighth of an inch per length of the slide fastener between its ends prior to piercing certain opposed and spaced end portions of the adjacent edges of the carrier tapes of the slide fastener with the first and second pairs of pins.

3,936,924

RELEASEABLE STEEL CABLE ANCHOR AND METHOD FOR WITHDRAWING THE SAME

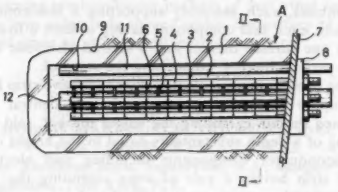
Yoshio Ichise, 20-6 Kitazawa 1-chome, Satagaya, Tokyo, and Kinichiro Sato, 2-47 Nakamachi 1-chome, Kaganei, Tokyo, both of Japan

Filed Jan. 25, 1974, Ser. No. 436,547

Claims priority, application Japan, Sept. 21, 1973, 48-106601; Dec. 14, 1973, 48-140462

Int. Cl.² B23P 19/02

U.S. Cl. 29—427 14 Claims



1. A method of withdrawing steel cables having terminal end portions from a cable anchor which includes at least one steel cable encased in a thermally fusible, combustible thermoplastic resin bonding material, having a fusing temperature and a combustion temperature, and embedded within a hardenable material, said method comprising the steps of: heating said thermally fusible bonding material within said hardenable material to at least said fusing temperature wherein said cable is debonded from said bonding material, and applying a tensional force longitudinally along said cable, thereby withdrawing said cable from said anchor.

3,936,925

METHOD FOR ATTACHING EXTRUSIONS AND THE LIKE TO FRAME MEMBERS

Dewey M. Simms, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 356,394, May 2, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,453

Int. Cl.² B23P 11/02

U.S. Cl. 29—446 4 Claims

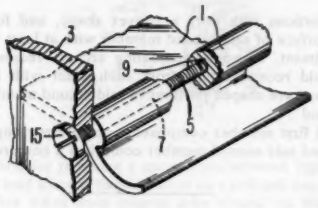
1. A method of attaching an extrusion or the like to a frame member or the like, said method being effective for providing a secure connection therebetween irrespective of the weight of the extrusion or the displacement forces applicable to the extrusion or to the frame member that would tend to effectuate their inadvertent disconnection, said method comprising the steps of:

a. forming a cylindrical channel in said extrusion in an edge thereof that is to be connected to said frame member,

b. forming an aperture of equal or slightly greater diameter than the diameter of said cylindrical channel in said frame member in an area thereof to which said extrusion is to be attached,

c. selecting or forming a self-locking pin of predetermined configuration and of a diameter slightly less than the diameter of said cylindrical channel, said predetermined configuration of said pin providing a shank portion defining the diameter of said pin, a head portion, a nose portion opposite said head portion and including inclined conical slopes leading in an increasing order of diameter from a leading edge thereof, a conical recess contiguous to and sloping inversely relative to said conically sloping nose portion, and a compressible and expandable C-shaped spring translatably carried in said conical recess and having an outer diameter slightly greater than the diameter of said shank portion when said spring is disposed in a relaxed state in a discrete position corresponding to the smallest diameter of said recess,

d. installing a resilient concave washer on the shank portion of said pin adjacent the head portion thereof,



e. inserting said self-locking pin through said aperture formed in said frame member and into said cylindrical channel formed in said extrusion, said insertion being accompanied, nearing the completion thereof, by the application of sufficient force to overcome the resiliency of said washer between said head portion of said pin and said frame member, and

f. releasing said pin to the expelling force applied by said resilient concave washer thereto, said expelling force being effective to translate said pin slightly outwardly of said channel and to thereby expandably translate said C-shaped spring carried in said conical recess to a discrete position therein corresponding to an increased diameter thereof wherein said spring is grippably impinged against the walls of said cylindrical channel formed in said extrusion to rigorously resist withdrawal of said pin therefrom and separation of said extrusion from said frame member.

3,936,926

METHOD OF COUPLING COMPRESSOR IMPELLERS AND SHAFTS

Hanns Hornschuch, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 444,740, Feb. 22, 1974, abandoned, which is a division of Ser. No. 349,656, April 10, 1973, Pat. No. 3,826,587. This application June 11, 1975, Ser. No. 585,999

Int. Cl.² B23P 19/02

U.S. Cl. 29—525 1 Claim

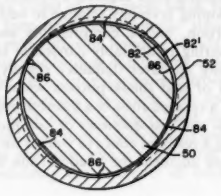
1. A method of coupling first and second members, comprising the steps of:

forming said members with surfaces which, upon the latter being interjoined in a first engagement mode, effect a mutual, slidable engagement therebetween, and upon said surfaces being interjoined in a second engagement mode, defined by only a rotation of the surface of one said members relative to the surface of the other of said members, effect a torqued, interference fit therebetween;

slidably engaging said members in said first engagement mode; and

rotating said surface of said one member relative to the surface of said other member; wherein

said forming step comprises forming said surface of said first member with at least three equidistant and arcuate lobes, spacing said lobes apart from each other with intervening portions of said surface, and forming said intervening



portions with only a convex shape, and forming said surface of said second member with at least three, equidistant, lobe-accommodating arcuate recesses, spacing said recesses apart from each other with intervening, concave-shaped portions of said second member surface; and

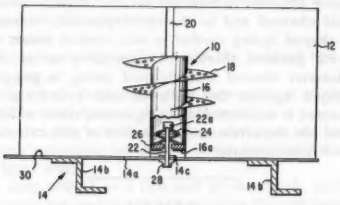
said first member comprises a compressor impeller shaft, and said second member comprises a compressor impeller.

3,936,927

AUGER ATTACHMENT METHOD FOR INSULATION

William C. Schneider, Houston, Tex., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed July 24, 1974, Ser. No. 491,417
Int. Cl.[2] B23P *19/00*
U.S. Cl. 29—526 1 Claim



1. A method of attaching a rigidized surface insulation to a spacecraft comprising the steps of:

a. drilling a clearance hole in one side of said insulation, said clearance hole extending for only a portion of the thickness of said insulation;

b. drilling a tool hole on the opposite side of said insulation, coaxial and in communication with said clearance hole, said tool hole being located on the side of said insulation which will be exposed to an extreme temperature environment;

c. installing a blind-end fastener in a selected location on said spacecraft;

d. inserting an auger attachment means in said insulation through said clearance hole in said insulation, said auger having an attachment screw integral therewith, and connected to said auger by preloaded spring means;

e. aligning said attachment screw with said blind-end fastener; and

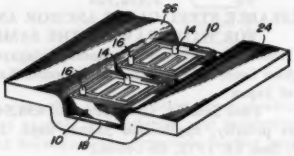
f. securing said insulation in place by tightening said attachment screw by means of a tool inserted through said tool hole and communicating with said attachment screw.

3,936,928

METHOD FOR PROVIDING MOUNTING ASSEMBLIES FOR A PLURALITY OF TRANSISTOR INTEGRATED CIRCUIT CHIPS

Gene P. Hopp, Wheeling, Ill., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 403,370, Oct. 4, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,297
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 6 Claims



1. The method of providing a plurality of individual mounting assemblies, each assembly supporting a semiconductor component, each said component having at least a first electrode on one surface thereof and a second electrode on the opposite surface thereof, comprising the steps of:

forming one continuous electrically conductive strip having an upper surface and one continuous central cavity formed therein extending the length thereof, said cavity being of a depth substantially equal to the height of said semiconductor components including said electrodes, said strip having a pair of arms extending the length thereof and protruding outwardly therefrom, one on each side of said cavity,

first tinning said arms and central cavity portions of said upper surface of said strip with solder,

then placing said semiconductor components in said cavity in spaced relation so that a first one of said electrodes of each said components is in contacting engagement with said strip in said cavity,

reheating said strip to a temperature whereby said solder flows to attach said semiconductor components to said strip at said first electrodes, and

severing said strip as provided in the heating step transversely between adjacent semiconductor components to provide said plurality of individual mounting assemblies with an individual semiconductor component supported on each mounting assembly.

3,936,929

FET AND BIPOLAR DEVICE AND CIRCUIT PROCESS WITH MAXIMUM JUNCTION CONTROL

Kenneth E. Bean, and William W. Lloyd, both of Richardson, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 275,116, July 26, 1972. This application June 26, 1974, Ser. No. 483,264
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—580 8 Claims

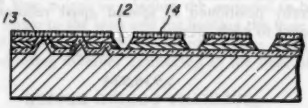
1. A method for producing dielectrically isolated electronic devices on a supporting electrically isolated substrate comprising the steps of:

a. forming a plurality of orientation-dependent-etched grooves of precisely-known, different depths in a low-resistivity monocrystalline semiconductor body of one conductivity type,

b. forming an insulation layer on said body and in said grooves,

c. depositing a polycrystalline semiconductor support layer on said insulation layer,

d. removing monocrystalline semiconductor material from the backside of said body, until a first layer having the desired thickness is achieved, as indicated by exposure of said insulation layer in the bottom of a selective groove,



e. forming a second monocrystalline semiconductor layer of the other conductivity type overlying said first layer, to a desired thickness as indicated by said grooves,

f. forming isolation moats circumscribing said first and second layers at a location spaced from said grooves, said moats extending to said substrate and providing a single crystalline mesa comprising said first and second layers, and

g. forming semiconductor pockets of said other conductivity type selectively spaced within the surface of said second layer to provide active device regions.

3,936,930

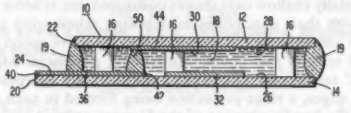
METHOD OF MAKING ELECTRICAL CONNECTIONS FOR LIQUID CRYSTAL CELLS

Herman Abraham Stern, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 270,245, July 10, 1972, abandoned. This application May 6, 1974, Ser. No. 467,150

Int. Cl.² H01S 4/00

U.S. Cl. 29—592 **4 Claims**



1. In a method of fabricating a liquid crystal cell, the improvement comprising:

providing on a surface of a first glass substrate first and second spaced apart conductive layers,

adhering to a portion of said first layer a slurry of glass in the form of a bump, said slurry having conductive particles therewithin,

providing on a surface of a second glass substrate a third conductive layer,

disposing said two substrates in face-to-face spaced apart relation with said second and third layers disposed in overlapped relation and with said bump disposed in alignment with a portion of said third layer, and

simultaneously fusion bonding said bump to said first and third layers while maintaining a space between said substrates, said bump providing an electrical connection between said first and third layers and spanning the space between said substrates.

3,936,931

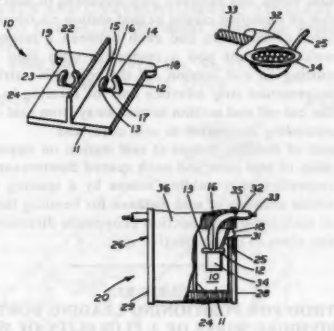
METHOD EMPLOYING A LEAD HOLDER TO RETAIN A LEAD CONNECTION ON AN ELECTRICAL COIL

Donald S. Hubbartt, Winnebago, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed June 5, 1974, Ser. No. 476,421

Int. Cl.² H01F 41/10, 5/04

U.S. Cl. 29—605 **3 Claims**



1. A method for retaining a connection between insulated magnet and lead wires in fixed position on a coil and insulating the connected wires from magnet wire wound on the coil comprising the steps of positioning the wires side-by-side and with adjacent ends, joining the adjacent ends in an electrical connection having a transverse dimension larger than the diameter of the insulated lead wire, squeezing the insulated parallel wires transversely through a gap into a snugly confining space between projections from the surface of an insulating base, and affixing said base to the coil.

3,936,932

METHOD AND APPARATUS FOR MAKING FILTER ELECTRODES

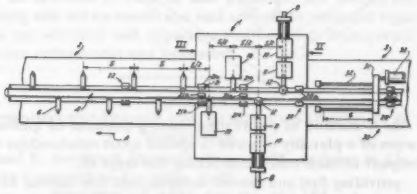
Rudolf Gerber, 8134 Adliswil, Birkenweg 11, Switzerland

Filed Feb. 5, 1975, Ser. No. 547,400

Claims priority, application Switzerland, July 9, 1974, 9408/74

Int. Cl.² H01R 43/00

U.S. Cl. 29—628 **10 Claims**



1. An apparatus for making a filter electrode, said apparatus comprising:

core feed means for longitudinally advancing in a transport direction toward a work station and in a succession of steps each having a length equal to an even multiple of a predetermined distance a pair of Ω-section metallic channels having coextensively contacting flat flanges and forming a straight hollow core;

a pair of supplies of metallic strip at said station;

a pair of strip feed means at said station on opposite lateral sides of said core and spaced apart in said transport direc-

tion by said distance for advancing said strips by an increment from said supplies incrementally in opposite directions toward said core on each stepwise advance of said core;

a pair of spot-welding means at said station on opposite lateral sides of said core and each between the respective strip feed means and said core for spot welding the ends of said strips to the respective coextensively contacting flanges of said core after each incremental advance of said strips and between step advances of said core;

a pair of stamping means at said station on opposite lateral sides of said core and each between a respective spot-welding means and a respective strip feed means for cutting an end section off the respective strip on each incremental strip advance and for forming in the end of the cut-off end section turned away from said core a split extending transverse to said core; and

a pair of bending means at said station on opposite lateral sides of said core and each spaced downstream from the respective spot-welding means by a spacing equal to a whole multiple of said distance for bending the split ends of each cut-off end section in opposite direction on opposite sides of the respective split.

3,936,933

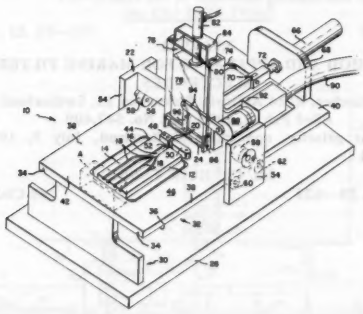
METHOD FOR POSITIONING LEADING PORTIONS OF INDIVIDUAL WIRES OF A PLURALITY OF WIRES IN SPACED APART RELATIONSHIPS WITH RESPECT TO EACH OTHER AND A TEMPLATE UTILIZED IN ACCOMPLISHING THE SAME

Kenneth Foster Folk; Milton Dean Ross, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 389,924, Aug. 20, 1973, Pat. No. 3,891,013. This application Apr. 2, 1975, Ser. No. 564,523

Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **11 Claims**



1. A method of positioning leading portions of individual wires of a plurality of wires in spaced apart relationships with respect to each other, comprising the steps of:

providing first and second surfaces, said first surface having a primary groove capable of substantially accommodating therein a trailing portion of each of said wires in a bunched together condition and a plurality of secondary grooves which emanate from said primary groove along separate, spaced apart paths, each of said secondary grooves capable of substantially accommodating therein said leading portion of only one of said wires;

positioning said trailing portions of said wires in said bunched together condition in said primary groove of said first surface;

introducing an application of compressive forces on said wires at said trailing portions thereof by bringing said second surface and said primary groove of said first surface into close proximity to each other while said trailing portions are so positioned in said primary groove of said first surface; and

continuing said application of said compressive forces simultaneously along said wires by moving at least one of said first and second surfaces relative to the other such that said application of said compressive forces simultaneously progresses along each of said wires from said trailing portion toward said leading portion of each of said wires whereby said leading portions of said wires are forced individually into respective secondary grooves and thereby positioned in spaced apart relationships with respect to each other.

3,936,934

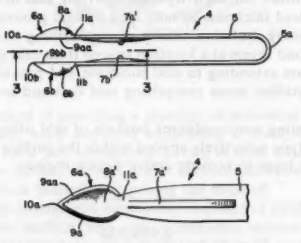
CULINARY CORING DEVICE

Nancy Bowden, 40 E. Clinton Ave., Tenafly, N.J. 07670

Filed Jan. 23, 1975, Ser. No. 540,890

Int. Cl.² A47J *23/00, 25/00*

U.S. Cl. 30—113.2 **2 Claims**



1. A culinary device comprising in combination: a handle element having opposite distal ends thereof projecting in a common direction, said handle element being tong-shaped with the opposite distal ends thereof extending in said common direction and having two separate and spaced-apart spoon bowls mounted unitarily one from one of the distal ends and the other from the remaining other distal end as a unitary single stamped-strip of material with the handle element being bent into substantially a U-shape, said spoon bowls being of substantially shallow oval shapes positioned one relative to the other with their concavities in opposing relationship to one another and with the distal ends of the respective spoon bowls pointed both in said common direction, peripheral edges of each of said spoon bowls being substantially sharpened as cutting edges, a ridge-projection being formed in each of the legs of the handle element of the U-shape strip at respective positions adjacent the spoon bowls respectively, with each rigid projection extending in a direction parallel to a longitudinal axis of the handle element whereby each leg of the U-shape strip is strengthened adjacent the respective spoon bowl.

3,936,935

MITERING APPARATUS

Walter J. Gregory, c/o 303 S. Doty, Stillwater, Okla. 74074

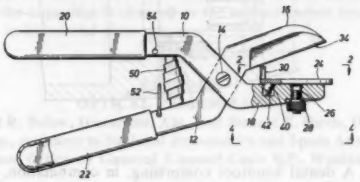
Filed Mar. 12, 1975, Ser. No. 557,773

Int. Cl.² B26B *17/00*

U.S. Cl. 30—179 **4 Claims**

1. Apparatus for cutting elongated material, such as molding, at a selected angle to its longitudinal axis for miter joints and the like, comprising first and second members, means connecting the members intermediate their ends for relative pivotal scissor type movement so that the portions of the members on one side of the connecting means provide jaws and the portions of the members on the other side provide handles for moving the jaws toward and away from each other, a cutting edge carried by the jaw of the second member for

cutting the material at the desired angle when the jaws are moved together by the handles to force the cutting edge on the jaw of the second member through the material positioned on the jaw of the first member, means for positioning the material on the jaw of the first member for cutting at a selected angle to its longitudinal axis, said means including a base plate and stop means carried by the base plate to engage the material to be cut and position the material in a preselected position on the base plate, means mounting the base plate between the jaws and on the jaw of the first member for rotation around an axis parallel to the direction of movement of said jaws for locating the stop means to position the material to be cut at the desired angle to the jaws and for holding the base plate in the desired position, said mounting means including a threaded mounting member connected to the base plate and



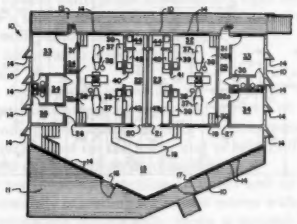
extending through the jaw to allow pivotal movement of the plate around the longitudinal axis of the mounting member and a nut in threaded engagement with the mounting member to engage the lower side of the jaw and clamp the plate in the desired position when rotated in one direction and to move out of engagement with the jaw when rotated in the other direction to allow the plate to be positioned for the stop means to hold the material at the desired angle to be cut, said stop means comprising two spaced stop plates having aligned surfaces to engage the material to be cut, said stop plates being spaced apart and of a length to allow the cutting edge on the jaw of the first member to pass therebetween when the plate is positioned to make a cut of 90° to the longitudinal axis of the material and to allow the cutting blade to clear the stop plates when the plate is positioned to make a cut of 45° to the longitudinal axis of the material.

3,936,936

DENTAL CLINIC

William Lewis Knudson, 105 E. Skyline Drive, Brigham City, Utah 84302

Filed June 23, 1969, Ser. No. 835,454
Int. Cl.² A61C *19/00*
U.S. Cl. 32—1 **5 Claims**



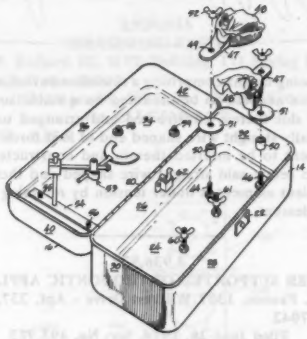
1. A dental clinic comprising
a building having an entrance and reception area;
at least one corridor extending from the entrance and reception area;
an operatory adjacent to each said corridor;
a wall cabinet containing dentist's equipment extensible out from each side thereof, extending partially across each operatory centrally thereof and dividing the operatory into sections;
a doorway from each said corridor opening into each section of the operatory; and
a patient's chair in each section arranged such that a patient sitting therein is facing away from the wall cabinet.

3,936,937

TRANSPORT CASE FOR GNATHOLOGICAL APPARATUS AND GNATHOSTOMATIC APPLIANCES

Woodford W. Gordon, 121 Miraloma Drive, San Francisco, Calif. 94127

Filed Nov. 19, 1973, Ser. No. 417,073
Int. Cl.² A61C *19/00*
U.S. Cl. 32—1 **8 Claims**



1. A transport case for gnathological apparatus comprising a rigid case having side walls, a top wall, and a bottom wall, said side walls defining a parting line and a hinge at the parting line on one of the side walls to afford access to the interior of the case, a plurality of threaded studs secured rigid with at least one of said case walls and projecting interior of the case, at least one impression tray with an impression thereon and having therein a hole remote from the impression suitable for positioning on a stud, a face bow with a base bar attached thereto having at least one hole therein suitable for positioning on a stud, means for securing said impression tray and face bow onto said studs, a rigid cross bar mounted within said case in spanning relation between two opposite side walls thereof, a set-up model having a threaded hole in the bottom thereof, an articulator having a first element and a second element with an aperture in each of said elements, and means for securing said set-up model and said articulator onto said rigid cross bar whereby said apparatus can be safely transported between orthodontist and laboratory.

3,936,938

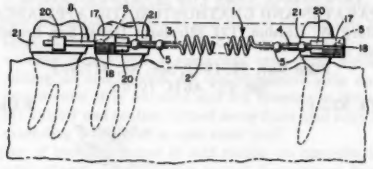
ORTHODONTIC SPRING APPLIANCE AND SPRING CLIP THEREFOR

Michael E. Northcutt, Mountain View, Calif., assignor to Aledyne Corporation, Los Altos, Calif.

Filed May 17, 1974, Ser. No. 471,175
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 A **17 Claims**

1. An orthodontic treatment assembly for applying repositioning forces to teeth in a patient's mouth comprising, in combination, means suitable for insertion in the mouth to produce a tension force, said tension producing means comprising a resilient element that produces a stable and predictable force upon elongation of said element, said resilient element having a first end and a second end opposite to said first end, wherein both of said ends are capable of being retained when force is applied thereto, at least one of said ends comprising a force determining element consisting essentially

of a substantially straight wire having a plurality of positioning elements thereon, said positioning elements being located on said substantially straight wire at predetermined intervals spaced from each other whereby the amount of elongation of said tension producing means and the force generated thereby is dependent upon which of said positioning elements is inserted in and retained by a retention device, and means for retaining both ends of said resilient element, at least one of



said retaining means comprising a retention device, said retention device adapted to be mounted on a stable support and having a slot therein constructed and arranged to permit a substantially straight wire shaped end of said force determining element to be inserted therein and constructed and arranged to retain said straight wire shaped end therein when said resilient element is under tension by retaining said positioning element.

3,936,939

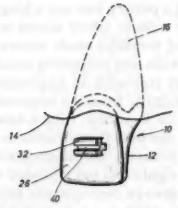
VENEER SUPPORTED ORTHODONTIC APPLIANCE

Frank R. Faunce, 1307 Wilcrest Drive - Apt. 237, Houston, Tex. 77042

Filed June 28, 1974, Ser. No. 493,973

Int. Cl.² A61C 7/00

U.S. Cl. 32—14 A 13 Claims



1. An orthodontic appliance assembly for attachment to the tooth structure of a patient, said orthodontic appliance assembly comprising:

a fully cured pre-formed thin veneer body of plastic material, said veneer body defining a concave interior surface that is shaped to conform to a portion of the exterior surface area of at least one of the patients teeth and defining an exterior surface that conforms to the natural configuration of the teeth of the patient; and

an orthodontic appliance, said appliance having a base portion and an active portion, said base portion being formed to define plastic interlocking means, said base portion being molded within said thin veneer body and said plastic material being interconnected with said base portion and firmly supporting said base portion, said active portion of said appliance protruding from said veneer body and having an orthodontic connector portion formed thereon, said connector portion being of generally T-shaped crosssection defining an arch wire slot and defining opposed wire retaining flanges for receiving ligature wires, said connector portion of said orthodontic appliance being spaced from the exterior surface of said thin veneer body.

3,936,940

DENTAL HANDTOOL

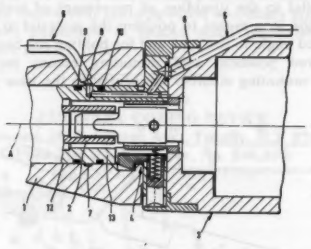
Hans Loge, Biberach an der Riss, Germany, assignor to Kaltenbach & Voight, Germany

Filed July 3, 1974, Ser. No. 485,758

Claims priority, application Germany, July 6, 1973, 2334448

Int. Cl.² A61C 1/08

U.S. Cl. 32—26 8 Claims



1. A dental handtool comprising, in combination, an extended hand sleeve; a driving shaft located at the center of said sleeve for rotary movement of a tool for dental treatment, said tool being at one end of said sleeve, a freely rotating driving part disconnectably attached to the handtool at the opposite end of said sleeve; a coolant pipe for feeding coolant to the region of said dental tool, said coolant pipe having a first coolant section inside said driving part and having a second section inside said sleeve; a ring channel; said coolant sections being disconnectably coupled by said ring channel when in the connected state; sealing elements on two sides of said ring channel, the coolant section inside said driving part entering said ring channel radially from said driving part.

3,936,941

WHEEL SLIDE PROTECTION SYSTEM

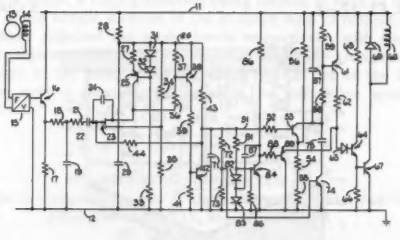
Leonard Ramsay Hiscox, Birmingham, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Jan. 11, 1974, Ser. No. 432,653

Claims priority, application United Kingdom, Jan. 19, 1973, 2820/73

Int. Cl.² B60T 8/08

U.S. Cl. 303—21 BE 5 Claims



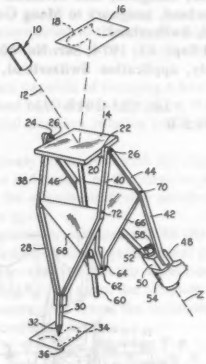
1. A wheel slide protection circuit comprising in combination first switch means driven from a first state to a second state when the deceleration of the wheel exceeds a predetermined value and driven back to its first state when the wheel accelerates, control means coupled to the first switch means and normally occupying a first state, the control means being driven to a second state when the first switch means is in its second state and then effecting release of the brakes from the wheel, the maximum time for which the control means is in its

second state after the first switch means reverts to its first state being restricted, and circuit means operable when the first switch means reverts to its first state to maintain the control means in its second state for a period of time inversely related to the rate of acceleration of the wheel, said circuit means including second switch means driven from a first state to a second state at an acceleration level greater than the acceleration level at which the first switch means reverts to its first state, the control means reverting to its first state when the second switch means is driven to its second state, and in which the circuit means includes a capacitor which is held discharged while the first switch means is in its second state but when the first switch means reverts to its first state charges by way of the second switch means, the charging current of the capacitor holding the control means in its second state, whereby the control means remains in its second state until either the capacitor is charged or the second switch means is driven to its second state.

3,936,942
OPTICAL PANTOGRAPH

Robert R. Belew, Huntsville, Ala., and Donald E. Davis, Upton, Mass., assignors to National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Dec. 11, 1974, Ser. No. 531,573
Int. Cl.² B43L *13/10*; G02B *5/08*
U.S. Cl. 33—24 R **2 Claims**



1. An optical pantograph for directing light beams and the like from a source to a receiver according to a predetermined pattern, said pantograph comprising:

a first downwardly extending leg;

a mirror;

means for pivotally attaching an upper end of said first downwardly extending leg to said mirror with said first leg extending downwardly along a first longitudinal axis;

a pointer carried on the lower end of said first leg;

a second downwardly extending leg;

means for pivotally attaching an upper end of said second downwardly extending leg to said mirror with said second leg extending downwardly along a second longitudinal axis at an angle to said first axis;

means for focusing collimated light beams along one of said axes to said mirror for reflection from said mirror;

means for receiving said light beams reflected from said mirror, said receiving means being located on the other of said axes;

a third downwardly extending leg centrally disposed between said first and second legs and having an upper end attached to said mirror;

a slidable joint;

a lower portion of said third leg extending through said slidable joint;

a pivotal brace means carried between said first and second legs and said slidable joint for maintaining the distance between said first leg and said third leg equal to the distance between said second leg and said third leg;

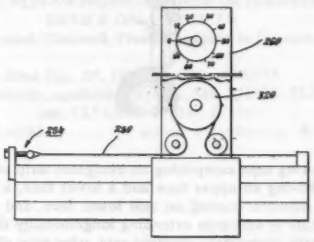
means for rotatably securing said second leg on a horizontal plane for rotation only about said second axis so that said first leg moves relative to said second leg as said pointer is moved about said pattern;

whereby a light beam reflected from said mirror to said receiver is angularly reflected according to the angular movement of said first leg relative to said second leg.

3,936,943
MEASURING SYSTEM

Edward P. Bullard, III, MTD Building, 171 Spring Hill Road, Trumbull, Conn. 06611

Filed Apr. 15, 1974, Ser. No. 460,720
Int. Cl.² G01B *5/02*
U.S. Cl. 33—125 R **8 Claims**



8. In a measuring device having a fixed part and a movable part, the combination comprising

A. a tape having a plurality of spaced openings along a line parallel to the longitudinal center line of said tape;

1. the centers of said openings being spaced a distance of S from one another;

B. a cylinder having a circumference slightly less than NS and rotatably mounted on one of the fixed or movable part of said device, and around which said tape is closely engaged on an arc of said cylinder of more than 180° and less than 360°, N being a small whole number,

1. said tape being held in such engagement by idlers adjacent said cylinder,

2. said cylinder wheel axis being perpendicular to the plane of the tape longitudinal center line,

3. and having N projections extending from the periphery of said cylinder,

a. with the centers of said projections being spaced around said cylinder at angles of $2\pi/N$ radians,

b. each of said projections closely interfitting into said tape openings;

C. securing assemblies at each end of said tape on the part of said device other than that on which said cylinder is mounted,

1. said tape being held under tension by said securing assemblies,

2. said securing assemblies and idlers being aligned to hold the longitudinal center line of said tape in a single plane along the operative length of said tape; and

D. means for translating and displaying the rotative movement of said cylinder into units of measurement.

3,936,944

LINEAR CUT SEWING TAPE

Zachary Paul Byne, 140 Eighth Ave., Brooklyn, N.Y. 11215

Continuation-in-part of Ser. No. 244,562, April 7, 1972, Pat. No. 3,797,120. This application Mar. 18, 1974, Ser. No. 452,142. The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² G01B 3/10

U.S. Cl. 33—137 R 2 Claims

1. A sewing tape comprising an elongated strip of flexible material having an upper face and a lower face, a pressure sensitive adhesive coating on said lower face, and fully cut through cuts in said strip extending longitudinally the length of said strip completely dividing said strip into ribbons of predetermined width, said strip having a plurality of imperforate depressions in the lower face and projecting upwardly of said upper face causing some of said pressure sensitive adhesive coating to extend across said cuts holding said ribbons together, a plurality of longitudinally extending lines on said upper face closely coinciding with at least some of said cuts, said lines extending parallel to each other, indicia on said upper face indicating the distance each of said lines is from an edge of said strip, a plurality of transverse lines on said tape extending normally to said strip and marking at least some of said ribbons into sections of predetermined length, some of said transverse lines extending from one edge of said strip to one of said cuts, and others of said transverse lines extending from another edge of said strip to another of said cuts.

3,936,945

DIAL GAUGE MEASURING DEVICE

Milan P. Jevremov, 2515 Lawnshire Drive, Copley, Ohio 44321

Filed June 6, 1974, Ser. No. 476,926

Int. Cl.² G01B 3/28

U.S. Cl. 33—172 R 14 Claims

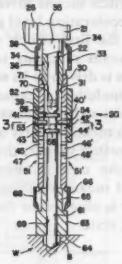
1. A device for use with measuring instruments including dial gauge indicators and the like which have a movable plunger for determining dimensions of a workpiece, comprising:

a body member having a bore therethrough receiving the plunger and further having an adjustment slot extending through at least one wall thereof and communicating with said bore;

means for mounting said body member to the measuring instrument;

a sliding member carried on said body member over said adjustment slot; and,

shoulder means, engagable with said sliding member for supporting the plunger whereby movement of the plunger



is limited to a fixed distance as determined by the position of said sliding member on said body member.

3,936,946

GEAR TESTER FOR PITCH MEASURING

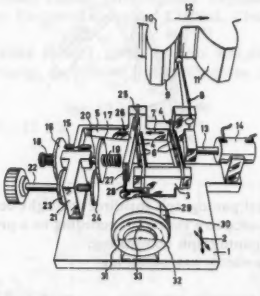
Heinz E. Ruffner, Langnau, and Meinrad Donner, Nuolen, both of Switzerland, assignors to Maag Gear-Wheel & Machine Co., Ltd, Switzerland

Filed Sept. 13, 1974, Ser. No. 505,910

Claims priority, application Switzerland, Sept. 14, 1973, 13254/73

Int. Cl.² G01B 7/28

U.S. Cl. 33—179.5 R 7 Claims



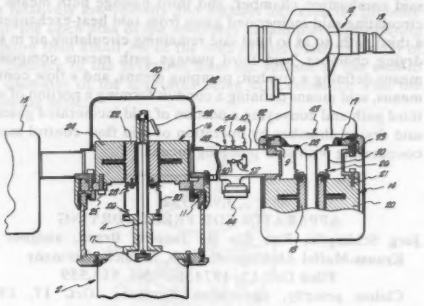
1. Feeler apparatus for gear testing comprising, in combination, a support, carrier means mounted on said support, a probe element held by said carrier means for engagement with a tooth flank of a gear to be tested, displacement means for adjusting the position of the element on the support between at least two alternative positions, said carrier means permitting movement of said element relative to the support in each of said positions, said displacement means comprising a motive power device for effecting the adjustment of said element between the alternative positions, and biassing means acting on said element to retain it in either position after each adjustment whereby the motive power device is operative only for the displacement of the element to each alternative setting.

3,936,947

ROTATING ARM AIMING DEVICE SYSTEM

Ralph E. Knapp, Canoga Park, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Filed Oct. 24, 1972, Ser. No. 299,865
Int. Cl. G01c 19/38
U.S. Cl. 33—275 G 28 Claims



1. In a north seeking gyro system for establishing an azimuth position of a remote object including establishing an azimuth position of a remote object including a north seeking gyro having a directional reference output and a reference axis, the improvement comprising:

a transfer arm;

mounting means connected to the transfer arm and the gyro for permitting movement of the transfer arm relative to the gyro;

an alignment device capable of focusing a line of sight at the remote object and rotatably mounted on the transfer arm at an offset radial position relative to the reference axis of the gyro;

first means operatively connected with the alignment device for providing an indication of the angular position of the line of sight of the alignment device relative to the reference axis of the gyro;

second means operatively connected with the gyro for providing an indication of the angular radial position of the alignment device relative to the directional reference output established by the gyro, the azimuth of the remote object being determined from the indication outputs of the first and second means.

3,936,948

METHOD FOR DETERMINING AZIMUTHAL DIRECTION RELATIVE TO TRUE NORTH

George P. Maselli, Chelmsford, Mass., assignor to Raytheon Company, Lexington, Mass.

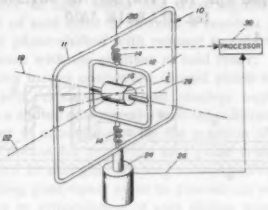
Continuation of Ser. No. 175,854, Aug. 30, 1971. This application Sept. 14, 1973, Ser. No. 397,558
Int. Cl. G01c 19/38
U.S. Cl. 33—301 10 Claims

1. A method for determining the difference in direction between a reference direction and a direction related to the earth's rotational axis using gyroscopic apparatus, such apparatus having an input axis, a spin axis and an output axis, each one of such axes being orthogonal to the other two of such axes, comprising the steps of:

a. continuously rotating, at a substantially constant rate, the input axis about the earth's vertical axis;

b. measuring, as the input axis is rotated, the precessional rates and accompanying restraint torques at the output axis during successive periods of time in which the input axis is rotated through a predetermined angle after having been aligned with the reference direction; and

c. determining the difference between the measured precessional rates and accompanying restraint torques at the output axis in successive ones of such periods of time, each such difference being indicative of the then existing



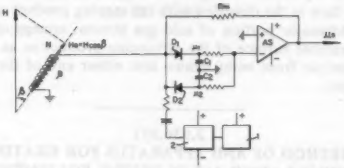
difference in direction between the reference direction and the direction relative to the earth's rotational axis.

3,936,949

STATIC NON-SWINGING COURSE DETERMINING DEVICE ON A VEHICLE

Jacques Devaud, Chabeuil, France, assignor to Grouzet, Paris, France

Filed Dec. 27, 1973, Ser. No. 428,774
Claims priority, application France, Jan. 2, 1973, 73.00084
Int. Cl.[2] G01C 21/08, 17/30
U.S. Cl. 33—352 4 Claims



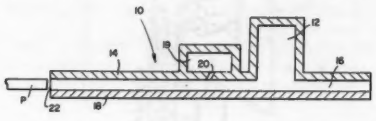
1. In a static non-swinging device for determining on board the course of a vehicle, comprising a magnetometer with three axes for determining the components of the earth's magnetic field along three axes fixed with respect to the vehicle, a vertical gyroscope for determining the attitude of the vehicle, and a computer for calculating the direction with respect to the vehicle of the horizontal component of the earth's magnetic field from signals produced by the magnetometer and the gyroscope, the improvement wherein the magnetometer comprises on each said axis of said magnetometer a single coil having a saturable core and further comprising means for supplying high frequency squarewave signals to each said coil, a plurality of adder amplifiers, each being associated with one of said coils, a plurality of coupling circuits, each connecting one end of one of said coils with an input of one of said amplifiers, each said circuit having a branch connected between said one end and said input, said branch having a diode their having one end thereof connected to said one end of said coil and a capacitor connected between the other end of said diode and common potential, said branch coupling peak signals due to the component of the earth's magnetic field from said coil along each said axis to said input of said adder-amplifier, and a supply resistor for said coil connected between the output terminal of said adder-amplifier and said one end of said coil wherein the output signal of said adder-amplifier is applied to said supply resistor.

3,936,950

METHOD OF INERTING THE ATMOSPHERE ABOVE A MOVING PRODUCT

Harden Henry Troue, Plainfield, Ind., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 16, 1974, Ser. No. 461,398
Int. Cl.² B01K 5/00
U.S. Cl. 34—4 10 Claims



1. A method of maintaining a substantially inert atmosphere over the treatable surface of a product which is to be subjected to irradiation while moving at a given speed of up to about 1000 feet per minute through the interior of an enclosure having a treating chamber and a first and second tunnel with the first tunnel located upstream of said chamber relative to said moving product and the second tunnel located downstream of said chamber; said method comprising the steps of:

a. forming a unidirectional stream of inert gas having a width at least about equal to the width of said moving product;

b. passing said unidirectional stream of inert so that the entire flow of inert gas supplied into said enclosure enters said treatable surface and forms an acute angle with respect thereto within a range of from above about 45° to below about 85°; and

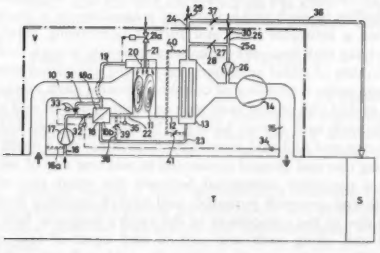
c. selecting said acute angle such that a major portion of said gas stream is caused to flow in a direction opposed to the advancing product and with a magnitude above the velocity of the moving and having a minor portion caused to flow in the direction with the moving product whereby said major portion of said gas stream, sweeps over the treatable surface of the advancing product so as to prevent air from being drawn into either end of the enclosure.

3,936,951

METHOD OF AND APPARATUS FOR HEATING CIRCULATING AIR IN DRYING EQUIPMENT

Rolf-Richard Haueise, Bietigheim, and Klaus Gäfgen, Hemmingen, both of Germany, assignors to Otto Dürr KG, Stuttgart, Germany

Filed Aug. 22, 1974, Ser. No. 499,584
Claims priority, application United Kingdom, Aug. 24, 1973, 40255/73
Int. Cl.² F26B 3/00
U.S. Cl. 34—35 16 Claims



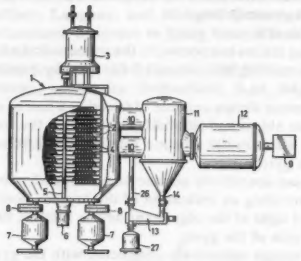
1. In an apparatus for heating air, particularly circulation air in drying equipment or the like, a combination comprising a drying chamber containing circulation air; a combustion chamber separate from said drying chamber; first passage path means for circulation of a portion of the air from said drying chamber in a first path and into said combustion chamber; second passage path means including a heat-exchanger for circulating incinerated gases from said combustion chamber in a second path to said heat-exchanger in which said incinerated gases exchange heat with said air in said first path, so as to preheat said air in said first path prior to entry thereof into said combustion chamber; and third passage path means for circulating said incinerated gases from said heat-exchanger in a third path, so as to heat said remaining circulating air in said drying chamber, said third passage path means comprising means defining a conduit, pumping means, and a flow control means, said means defining a conduit forming a portion of said third path and conveying a portion of said incinerated gases to said drying chamber by operation of said flow control means cooperating with said pumping means.

3,936,952

APPARATUS FOR FREEZE-DRYING

Jorg Schimpfle, Rua Rio De Janeiro, Brazil, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Oct. 17, 1974, Ser. No. 515,559
Claims priority, application Germany, Oct. 17, 1973, 2352101
Int. Cl.² F26B 13/30
U.S. Cl. 34—92 10 Claims



1. An apparatus for the freeze-drying of a product comprising, in combination:

a main dryer adapted to receive a frozen product and provided with means for heating said frozen product in vacuo to release vapor from said product and form a freeze-dried granulate therefrom;

a dust separator communicating with said dryer for separating dust from the vapor emerging therefrom;

a condenser connected to said dust separator for condensing the vapor upon separation of dust therefrom;

an after-dryer connected to said dust separator for receiving separated dust therefrom and drying said separated dust independently of said granulate; and

discharge means connected to said after-dryer and operable independently of the main dryer for discharging the dry dust from the apparatus as a product separate from said granulate.

3,936,953

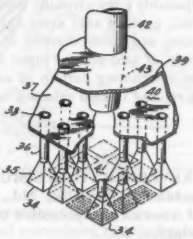
AIR IMPINGEMENT SYSTEM

James L. Chance, Rockford, and Shu Tang Han, South Beloit, both of Ill., assignors to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 405,142, Oct. 10, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 550,971
Int. Cl.² F26B 13/00
U.S. Cl. 34—160 10 Claims

1. An apparatus for drying a moving web comprising at least one air cap having a width corresponding to the width of the web to be dried, each air cap including at least one apertured

plate, hollow support means for positioning the plate in relatively close proximity to the web, a high pressure plenum connected to said support means for delivering high pressure air through the apertures in said plate to impinge against said web, said support means having a throat of lesser cross-sectional area than said plate between said plate and said plenum, thereby providing an exhaust region of extended area behind each plate into which the impinging air streams are directed at a relatively low velocity and without an excessive pressure drop, the open area of the apertures in said plate constituting no more than about 3% of the area of said plate, the ratio of the distance of the apertures from the surface of the web to the diameter of the apertures being in accordance with the following table:



Open area	Ratio of distance/ diameter
up to 1%	3 – 6
greater than 1% · up to 2%	2 – 5
greater than 2% up to 3%	2 – 4.

3,936,954

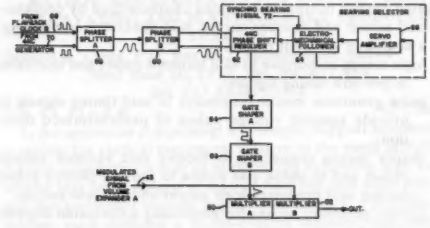
ELECTRONIC BEARING SELECTOR FOR OMNI-DIRECTIONAL SIGNALS

Warren A. Anderson, Tiverton, R.I.; Lawrence Rosenberg, Fairlawn, and Melvin H. Damon, Jr., Wayne, both of N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1964, Ser. No. 370,736

Int. Cl.² G09B 9/00

U.S. Cl. 35—10.4 **2 Claims**



1. An electronic circuit for use with apparatus having timing signal generating clock means and means for combining waveform information from a plurality of input channels into a single pulse train signal wherein time displacements of particular recurrent pulses along the pulse train signal time base, as established by said clock means, are indicative of the channels from which the particular pulses were derived, said electronic circuit comprising:

phase-splitter means responsive to said timing signal to provide two, timed, sine wave signals of equal magnitude but having a predetermined phase difference;

phase-shift resolver means connected to said phase-splitter means and having a stator and a rotor, said resolver being responsive to said timed sine wave signals and to the position of said rotor to provide a resolver ouput signal which is phase-shifted with respect to said time base in accordance with the position of said rotor;

gate shaping means connected to said phase-shift resolver means and responsive to said resolver ouput signal to provide a sliding gate signal which is positioned along said time base in accordance with the position of said rotor;

multiplier means for receiving said pulse train signal and connected to said gate shaping means and responsive to said sliding gate signal so as to provide an output corresponding to coincidence of said sliding gate signal and pulses of said pulse train signal, whereby positioning of said rotor can be utilized to select from said pulse train signal those pulses derived from particular ones of said plurality of input channels;

said multiplier means comprising means for forming said gate signal into a plurality of gate signals of differing widths and signal levels for passing coincident pulses within those widths, and summing means for summing the pulses so passed to provide smooth transition between different outputs resulting from changes in said rotor position.

3,936,955

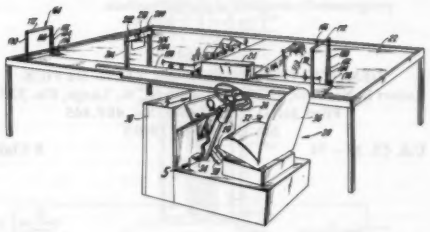
DRIVER TRAINING SIMULATOR

Herbert Gruen, Brooklyn; Kenneth R. Wisner, New York, and Tony Karp, Briarwood, all of N.Y., assignors to Driver Training Institute, Brooklyn, N.Y.

Filed Dec. 17, 1974, Ser. No. 533,519

Int. Cl.² G09B 9/04

U.S. Cl. 35—11 **40 Claims**

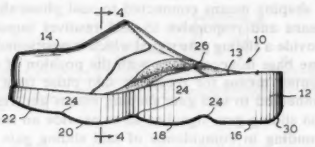


1. In a driver training simulator including simulated controls of a vehicle including a steering wheel, an accelerator pedal, and a brake pedal, and a reduced-size vehicle the movements of which are controlled by the operation by a student driver of one or more of said controls, the improvement which comprises: means for sensing whether the reduced-size vehicle is at rest or in motion, and means for producing a first resistance to the rotation of said steering wheel of a first magnitude when the reduced-size vehicle is at rest and for producing a second resistance to the rotation of said steering wheel of a second magnitude less than that of said first magnitude when the reduced-size vehicle is in motion.

3,936,956
REFLEX ACTION SOLE FOR SHOES HAVING SINUOUS CONTOURED BOTTOM SURFACE

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.

Filed Aug. 22, 1974, Ser. No. 499,493
Int. Cl.² A43B *13/04*
U.S. Cl. 36—32 R **19 Claims**

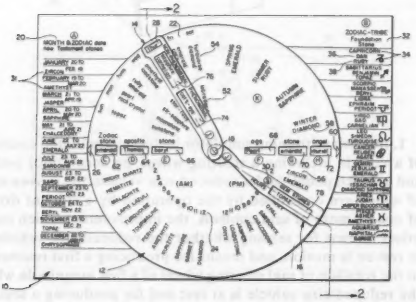


1. A reflex action one-piece sole for shoes, which comprises
a. a longitudinally extending thick body of resilient, shnock absorbing material;
b. said body including generally horizontal upper surfaces, an edge wall having front, side, and rear portions, and a bottom surface;
c. said bottom surface comprised of alternating crests and troughs extending completely thereacross and being generally perpendicular to the longitudinal axis of said body;
d. said crests including spaced, lowermost ground contacting portions;
e. said alternating crests constituting in succession, a forwardmost toe crest, an intermediate ball crest, an intermediate shank portion crest, and a heel crest, the lowermost ground contacting surfaces of the latter three crests lying in a substantially common plane;
f. said forwardmost toe crest being elevated with respect to the remainder of said crests and extending forwardly toward and terminating at front edge portions of said sole to provide a rolling, thrusting action as the sole is progressively engaged with a ground surface in walking; and
g. said heel crest extending upwardly and rearwardly toward and terminating in said rear edge portions of said sole to provide an initial rolling action as the sole is progressively engaged with a ground surface in walking;
h. said sole thereby providing a gentle rocking motion as it progressively contacts a ground surface.

3,936,957
DEMOTIC GEMSTONE INDICATING DEVICE

Robert B. Nordbye, 14297 - 102nd Ave., N., Largo, Fla. 33540

Filed July 17, 1974, Ser. No. 489,445
Int. Cl.² G09B *19/00*
U.S. Cl. 35—74 **8 Claims**

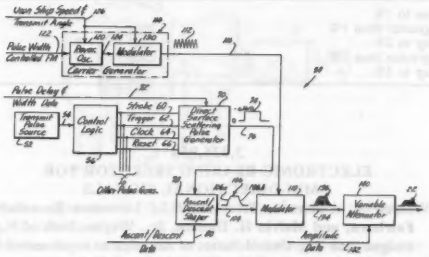


1. A gemstone indicating device comprising:
a base having a first set of input data designating specific birth information and a first set of symbolic output data related to said birth information;
a disc rotatably mounted on said base above said output data, said disc having an indicator thereon whereby said disc may be adjustable to input settings selecting one of said first input data;
a plurality of apertures in said disc overlying said first set of output data on said base, whereby said apertures will designate certain of said output data which are related to said selected input data;
said disc further having a second set of input data designating additional birth information and a second set of symbolic output data related to said additional birth information;
and a pair of adjustable arms pivotally mounted on said base above said disc, each of said arms having a plurality of first and second apertures therein, said first apertures selecting certain of said second input data and said second apertures designating certain of said second output data which is related to said selected second input data.

3,936,958
SONAR REVERBERATION SIMULATION

Arthur B. Clapsaddle, Cockeysville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 18, 1968, Ser. No. 740,815
Int. Cl.² G09B *9/00*
U.S. Cl. 35—10.4 **7 Claims**



1. A sonar reverberation signal generator for generating reverberation signal components comprised of a doppler-shifted carrier having an envelope characterized by predetermined ascent and descent curves, said generator comprising:
a source of transmit pulses;
logic means responsive to said transmit pulses and operative to provide timing signals;
pulse generator means responsive to said timing signals to provide squared voltage pulses of predetermined duration;
shaper means connected to receive said squared voltage pulses and to shape said pulses to provide shaped pulses having said predetermined ascent and descent curves;
carrier generator means for generating a simulated doppler shifted carrier signal;
modulator means connected to receive said carrier signal and said shaped pulses and operative to modulate the former with the latter to provide pulse modulated carrier signals having an envelope characterized by said ascent and descent curves; and
attenuator means connected to receive said pulse modulated carrier signals and operative to reduce the amplitude thereof to provide said simulated reverberation signal components.

3,936,959

SKI BOOT WITH REPLACEABLE LINER

Alden B. Hanson, and Chris A. Hanson, both of Boulder, Colo., assignors to Hanson Industries Inc., Boulder, Colo.

Filed Feb. 12, 1975, Ser. No. 549,203
Int. Cl.[2] A43B 00/00
U.S. Cl. 36—2.5 AL 7 Claims

1. A ski boot comprising:
a semi-rigid shell comprising a vamp having a rear opening;
a semi-rigid tongue member pivotally attached to said vamp near the lowermost portion of said rear opening, said tongue member being adapted to close said rear opening;
securing means for securing said tongue member in the closed position;
a first resilient liner member disposed in the forward section of said shell, said first liner member having an inner surface conforming substantially to the outer surface of a wearer's foot forward of the heel and Achille's tendon area thereof and an outer surface contoured to fit into the forward section of said shell;
a second resilient liner member disposed within the rearward portion of said shell, said second liner having an inner surface conforming to the outer surface of the heel and Achille's tendon area of the wearer's foot, and an outer surface contoured to fit the rearward section of said shell and abut the inner surface of said tongue member;
the edges of said first and second liner members abutting each other within said shell and cooperating to cover the entirety of the wearer's foot, at least said second liner member being readily removable from said shell.

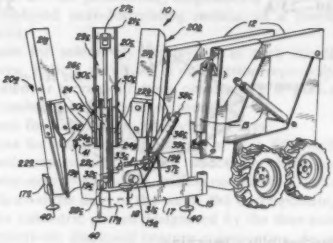
3,936,960

METHOD AND APPARATUS FOR ROOTED PLANT EXCAVATING AND PLANT PACKAGE PRODUCED THEREBY

Samuel E. Clegg, P.O. Box 252, Plainfield, Ill. 60544

Filed June 10, 1974, Ser. No. 477,854
Int. Cl.[2] A01G 23/04
U.S. Cl. 37—2 R 13 Claims

1. An apparatus comprising: a U-shaped support attached to a vehicle for vertical movement relative to the earth including a bight connecting a pair of horizontally extending legs, each of said legs being hinged at a point between said bight and its end for horizontal arcuate motion of said ends; a plurality of spades, each defining a frusto-conical segment, and means mounting each of said spades to said U-shaped support spaced from and surrounding a vertical central digging axis, each of said spades being mounted for independent receiprocal movement of said spades in a generally downward direction convergent toward said axis and upward divergent from said axis; power means connected to each of said hinged legs for pivoting said ends from a first position in line with said legs to a second position pointed away from each other; whereby a generally frusto-conical tapering hollow enclosure having a slightly larger opening at the top than the bottom and being open at both ends is formed by said spades when said ends are in said first position and said spades are moved to the bottom of their vertical travel, said enclosure opening along the side nearest the mouth of said U-shaped support when said ends are in said second position and said U-shaped support is moved to the top of its vertical travel; a severing member including a pair of arms, each having one end pivotally connected to one side of said U-shaped support and a blade connected between the opposite ends of said arms for swinging movement about a horizontal axis and beneath the lower opening of said enclosure, and the central portion of said blade being bowed outwardly with respect to said horizontal axis, whereby a frusto-conical tapering ball of earth with a convex bottom may be severed from the earth by the apparatus.

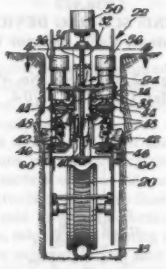


3,936,961

APPARATUS FOR COVERING DRAINAGE TUBING WITH FINE TEXTURED SOIL GRANULES

Lester Gahler, Canby, Oreg., assignor to Advanced Drainage Systems, Inc., Columbus, Ohio

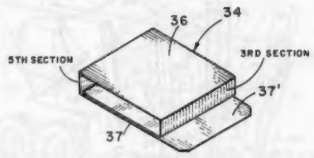
Filed Apr. 25, 1974, Ser. No. 463,995
Int. Cl.[2] E02F 5/22
U.S. Cl. 37—142.5 3 Claims



1. A device for covering drainage tubing with fine textured soil granules comprising a main framework, a pair of secondary frames mounted for swinging movement toward and away from one another about at least one vertically oriented axis, an adjustable connection between the main framework and the secondary frames including a motivator for varying the elevation of the secondary frames relative to the main framework, tiller means connected to the secondary frames including a pair of vertically oriented shafts, one journaled to each secondary frame, tines secured to and extending outwardly from each shaft, motivating means connected to rotate each shaft whereby the tines penetrate the side walls of a trench in which tubing has been positioned to thereby break away fine textured soil granules therefrom and shower them over the tubing, and a guide shoe connected to each secondary frame

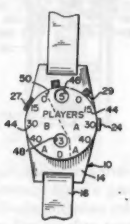
for engaging the side walls of the trench to thereby limit the penetration of the tines.

3,936,962
BOX CLIP
Olin B. Sparks, 8834 Birdwood Road, Houston, Tex. 77036
Division of Ser. No. 379,282, July 16, 1973, Pat. No. 379,282.
This application Sept. 5, 1974, Ser. No. 503,233
Int. Cl.² G09F 3/16
U.S. Cl. 40—23 A 2 Claims



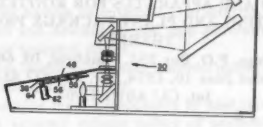
1. A tray box clip comprising:
a pliable rectangular shaped shell having a top horizontal wall, a first bottom horizontal wall, and two vertical walls interconnected with said horizontal walls, to form a hollow open-ended shell adapted to receive a tray therewithin,
a second bottom horizontal and external wall integral with one of the vertical walls and extending in a plane substantially parallel to said first bottom horizontal wall said second bottom horizontal and external wall consisting of two planar members having securing means therebetween,
a wire spring having an open ended curved configuration with one free leg of said spring being sandwiched between said planar members and the other free leg of said spring being elastically urged onto the exposed inner surface of the first bottom horizontal wall, thereby forming an integral and hollow shell with a rectangular cross-section, and
a slide tray adapted to be inserted in said shell.

3,936,963
TENNIS SCORING DEVICE
Kingsley Chan, Saratoga, Calif., assignor to Kingsley Chan, Saratoga, Calif.
Filed Aug. 12, 1974, Ser. No. 496,713
Int. Cl.² G09F 11/04
U.S. Cl. 40—70 R 7 Claims



1. A score recording device comprising:
a back member having a face and a pivot post projecting from the face;
a first disc rotatably mounted on the pivot post and having a first tab projecting radially outwardly from its periphery;
a second disc rotatably mounted on the pivot post and having a second tab projecting radially outwardly from its periphery;
a third disc rotatably mounted on the pivot post and having a first circle of scoring characters on its surface facing away from the face of the back member;
a fourth disc rotatably mounted on the pivot post, the surface of the fourth disc facing away from the third disc having both a second circle of scoring characters arranged concentrically with the first circle of scoring characters and an annular transparent portion radially aligned with the first circle of scoring characters, the first, second, third and fourth discs being arranged on the pivot post such that the first circle of scoring characters is otherwise visible through the transparent portion of the fourth disc and the first and second circles of scoring characters are otherwise visible when looking toward the face of the back member; and
a fifth, cover disc fixedly mounted on the pivot post and having two sets of scoring characters arranged in separate hemicircles on its surface facing away from the face of the back member, the first and second tabs being visible beyond the periphery of the cover disc and being rotatably alignable with the individual scoring characters of the respective hemicircles on the face of the cover disc by rotation of the first and second discs, respectively, the cover disc further having a first window in alignment with the first circle of scoring characters and a second window in alignment with the second circle of scoring characters such that selected ones of the scoring characters of the first and second circles of scoring characters can be made to appear in the first and second windows, respectively, by rotation of the third and fourth discs, respectively.

3,936,964
MICROFICHE SUPPORT
Augustus W. Griswold, Rush, and Boris W. Haritonoff, Geneseo, both of N.Y., assignors to Arcata Microfilm Corporation, Long Beach, Calif.
Division of Ser. No. 268,792, July 3, 1972, Pat. No. 3,802,979.
This application Oct. 4, 1973, Ser. No. 403,567
Int. Cl.² G09F 1/10
U.S. Cl. 40—104.18 12 Claims



1. An article comprising a microfiche including a transparent base and a plurality of microfilm frames removably mounted on said base in a plurality of parallel, equally spaced-apart rows, with all of any updatable frames being pre-cut and separate from all adjacent frames, whereby each one of said updatable frames can be removed from said base without first having to cut it away from any adjacent frame, and with all of any permanent frames being not all pre-cut and separate from all adjacent frames.

3,936,965

SUPPORT FOR FIGURE HAVING MOVABLE MEMBERS AND MEANS FOR MOVING SAME IN RESPONSE TO ACCELERATION OR DECELERATION

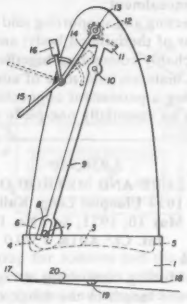
Borge Andreas Ravn, Rolighedsvej 10, DK-1958 Copenhagen, and Erik Froyr, Adelgade 16, DK-5600 Faborg, both of Denmark

Filed Nov. 14, 1973, Ser. No. 415,663

Claims priority, application Denmark, Nov. 15, 1972, 5671/72

Int. Cl.² G09F *19/08*

U.S. Cl. 40—106.35 3 Claims



1. A moveable device for supporting a moveable figure comprising a base having an upwardly-directed surface, means on said base including edges for supporting said base on a horizontal surface with said upwardly-directed surface in generally horizontal position and the device in operative position, means defining a longitudinal supporting path on said upwardly-directed surface, means including a roller supported on said path having an axis extending transversely thereto and freely moveable along said path under the influence of acceleration and deceleration of said device, said path having at each end means for limiting the movement of said roller, means including a superstructure mounted on said base for carrying a moveable figure on said device, said superstructure having moveable members pivotally mounted thereon, and mechanical transmission means connecting said roller to said moveable members, for transmitting the movement of said roller thereto said supporting path having a slightly upwardly convex curvature so that both ends thereof are disposed at a slightly lower level than the center portion of the path in the operative position of the device.

3,936,966

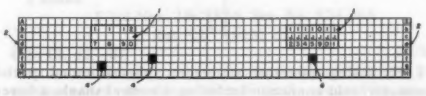
PERPETUAL CALENDARS

Arnold Ernst Zeiske, 6151 Palo Pinto Ave., Dallas, Tex. 75214

Filed Nov. 18, 1974, Ser. No. 524,954

Int. Cl.² G09D *3/00*

U.S. Cl. 40—109 4 Claims



1. A perpetual calendar comprising, in combination:

means for exhibiting a first viewing area;

means for selectively displaying, at such first viewing area, indicia designating a numeral consisting of at least one digit representative of a century;

means for the positioning, responsively to such selectively displayed century-designating indicia, of a second viewing area;

means for selectively displaying, at such second viewing area, indicia designating a numeral consisting of one digit representative of a decade;

means for the positioning, responsively to such selectively displayed decade-designating indicia, of a third viewing area;

means for selectively displaying, at such third viewing area, indicia designating a numeral consisting of one digit representative of a year;

means for the positioning, responsively to such selectively displayed year-designating indicia, of a fourth viewing area;

means for selectively displaying, at such fourth viewing area, indicia specifying a designation representative of a calendar period of time constituting a part of a year consisting of at least one month;

means for exhibiting a fifth viewing area;

means for resultingly displaying, at such fifth viewing area, and responsively to such selectively displayed partial-year-specifying indicia, indicia constituting, in correlation vis-a-vis the days of the week, the corresponding dates of the calendric period designated by the thus successively, selectively displayed century-representing, decade-representing, year-representing, and partial-year-period-representing indicia.

3,936,967

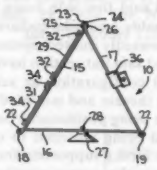
EMERGENCY SIGN DEVICE

Charles H. Davis, 302 Rollins Ave., Dothan, Ala. 36301

Continuation of Ser. No. 352,685, April 19, 1973, abandoned. This application July 18, 1974, Ser. No. 489,766

Int. Cl.² G09F *21/04*

U.S. Cl. 40—129 C 2 Claims



1. A device capable of being mounted on a horizontal surface of a motor vehicle for exhibiting emergency signs, comprising first, second and third plate sections of equal size, first hinge means interconnecting one side edge of said second plate section with one side edge of said first plate section, second hinge means interconnecting the other side edge of said second plate section with one side edge of said third plate section, flanges extending outwardly from the other side edges of said first and said third plate sections and being rigidly connected thereto, said flanges forming an angle greater than 90° with the outer surfaces of said first and said third plate sections, detachable fasteners provided on said flanges for detachably securing said first and third plate sections together in an assembled triangular-shaped support in which said flanges are in face-to-face contact with one another, means on one of said plate sections for detachably mounting said support to the horizontal motor vehicle surface, at least one pair of spaced, parallel channel-forming elements on another of said plate sections extending parallel to said side edges and opening toward one another for the reception of interchangeable emergency signs, and fastener means on said one plate section and on the remaining one of said plate sections for securing all of said plate sections together in a collapsed condition lying substantially parallel to one another, said fastener means including straps extending outwardly of opposite end edges of said one and said remaining plate sections and overlapping with opposite end edges of said another plate section in the collapsed condition of said support, said straps being

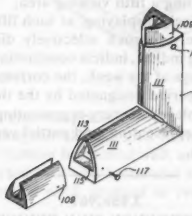
located on said one and said remaining plate sections so as to lie between said channel-forming elements when overlapping said another plate section, whereby the emergency signs are completely prevented from moving outwardly of said elements while in said collapsed condition.

3,936,968

ADJUSTABLE FRAME

Howard E. Gilbert, P.O. Box 294 Deering St., East Setaucket, Long Island, Suffolk County, N.Y. 11733

Division of Ser. No. 46,638, June 16, 1970, Pat. No. 3,823,499. This application July 18, 1973, Ser. No. 380,505
Int. Cl.[2] G09F 1/12
U.S. Cl. 40—155 3 Claims



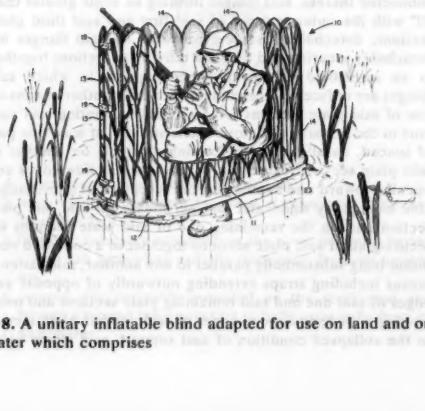
1. A frame comprising corner members mounted to support the corner portions of a picture, said corner members having a first inwardly curved upstanding side and a second upstanding side spaced apart from the first side by a flat section, said first and second sides being connected to opposite edges of said flat section and said first side being biased toward said second side to releasably grasp the picture and straight members having a first inwardly curved upstanding side by a flat section, said sides and said flat section having substantially the same cross-sectional configuration as said corner members and being insertable therein and mounted to support the side portions of an article being positionable between two adjacent corner members and being mounted to releasably grasp the sides of the article to form a supporting frame with said corner members, and wherein the corner members contain a slot at the corner sections to permit the parts of the corner sections to pivot.

3,936,969

INFLATABLE BLIND

Wilton Richard, 2230 South David Drive, Abbeville, La. 70510

Filed July 3, 1974, Ser. No. 485,525
Int. Cl.[2] A01M 31/00
U.S. Cl. 43—1 17 Claims



8. A unitary inflatable blind adapted for use on land and on water which comprises

1. an inflatable seat-forming cushion having a pouch aligned on one face thereof;
2. a flexible inflatable body comprising an elongate inflatable tubular base member and a plurality of inflatable pleated wall portions extending from one side of said base member and being disposed along substantially the entire length of said base member, said body being adapted:
   a. when deflated to be foldable upon itself into compact form to fit within said pouch, and
   b. when inflated to be bendable so that its two ends can be brought together with the wall portions extending upwardly from said base member to circumscribe a zone of concealment;
3. means connecting and supporting said cushion across the lower interior of the inflated body; and
4. means detachably connecting together said two ends of said body to maintain said zone of concealment;

said cushion having a permanent connection to said body so that the device is an essentially one-piece structure.

3,936,970

FISHING LURE AND METHOD OF FISHING

John A. Hodges, 1014 Uluopihi Loop, Kailua, Hawaii 96734

Filed May 10, 1971, Ser. No. 142,082
Int. Cl.[2] A01K 85/00
U.S. Cl. 43—17.6 2 Claims

1. A method of fishing comprising attracting fish with light having a peak wave length in the range of from 4500 A to 5000 A and catching said fish with a catching means, said light being emitted from a luminescent material comprising a phosphor, an extender capable of extending the emitting life of the phosphor and a suspending agent capable of suspending the phosphor in a plastic material, the weight ratio of the extender to the phosphor being in the ratio of from about 1:1 to about 4:1 and the ratio of the suspending agent to the phosphor being in the range of about 1:10 to 1:4.

3,936,971

FLY FISHING APPARATUS AND QUICK CONNECTOR THEREFOR

Welbourne D. McGahee, Melbourne, Fla., assignor to Loop-A-Line, Inc., Melbourne, Fla.

Filed Feb. 19, 1974, Ser. No. 443,872
Int. Cl.[2] A01K 91/04
U.S. Cl. 43—44.83 7 Claims

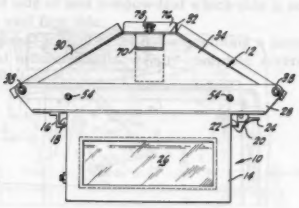
1. Fly fishing apparatus comprising a double-ended special connector, said connector including a central shank, a lower vertical eye connected to said central shank, a lower horizontal eye closing upon itself connected to said lower vertical eye and encircling said central shank, a first means on the upper end of said central shank for receiving a fly fishing line, a leader, an upper enlarged loop on said leader for engagement with said lower vertical eye, a lower enlarged loop on said leader, and a second fishing implement means connected to said leader lower enlarged loop, said lower horizontal eye having substantial diameter relative to said central shank so as

to provide sufficient space to pass said upper enlarged loop on said leader.

3,936,972
RODENT TRAP

Daniel B. Meyers, 164 Rome St., San Francisco, Calif. 94112, and Gary C. Yerby, 78 Lausanne St., No. 2, Daly City, Calif. 94104

Filed Nov. 20, 1974, Ser. No. 525,657
Int. Cl.² A01M *23/04, 23/12*
U.S. Cl. 43—69 **11 Claims**



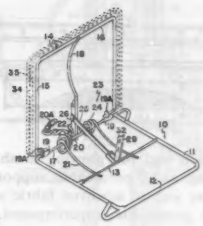
1. An animal trap for rodents and the like comprising: an enclosure having an open top; and, a bait compartment adapted to be coupled to, and arranged over, the open top of said enclosure, said bait compartment comprising a support structure for supporting said bait compartment over said enclosure; at least one tilting bottom panel having pivot means pivotally connected to said support structure for pivoting said panel from a first horizontal preoperative position over said enclosure to a second tilted operative position directed into said enclosure, said panel having a first end proximate to said pivot means and a second end distal to said pivot means, said panel having further mounted to said first end of said panel adjacent said pivot means first magnetic means and counterweight means for substantially balancing said panel at said pivot means, said panel and a substantial portion of said counterweight means being arranged above said pivot means when said panel is in said preoperative position; and, second magnetic means mounted to said support structure cooperatively arranged with said first magnetic means for retaining said panel in said preoperative position with a predetermined magnetic force; wherein said panel is displaced from said horizontal preoperative position to said tilted operative position by the moment of the rodent's weight on said panel, overcoming the retentive force of said two cooperating magnetic means, said counterweight means having an effective moment, opposite to the moment of a rodent's weight, which effective moment is substantially reduced when said panel is displaced from said preoperative position to said operative position.

3,936,973
ANIMAL TRAP

Walter Larocque, General Delivery, Swan River, Manitoba, Canada

Filed Nov. 18, 1974, Ser. No. 524,463
Int. Cl.² A01M *23/30*
U.S. Cl. 43—81 **4 Claims**

1. An animal trap comprising in combination a base frame section and a movable section hingedly secured by one side thereof to one side of said base section, spring means cooperating between said sections normally urging said sections towards one another to a trap sprung position and a combination trigger and bait holding assembly operatively connected between said sections to releasably hold said movable section at an angle from said base section in a trap set position against the pressure of said spring means, said trigger and bait holding assembly including a first member pivotally secured by one end thereof to one of said sections and being detachably engageable with the other of said sections to hold said sections in the trap set position, and a second member pivotally secured by adjacent one end thereof to adjacent the other end of said first member and engaging said other of said sections by said one end thereof whereby said other end of said second member extends within the angle formed by said sections

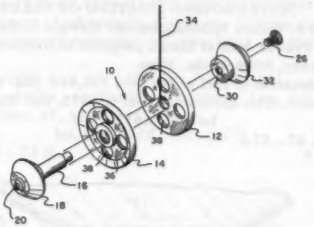


when in the trap set position and bait holding means on said other end of said second member, said second member cooperating with said first member and said other section to release said first member from said other section when said other end of said second member is moved a pre-determined amount.

3,936,974
COMBINED TOP AND YO-YO

Eugene R. House, Box 189, Road No. 1, Emporium, Pa. 15834

Filed Aug. 29, 1974, Ser. No. 501,612
Int. Cl.² A63H *1/30*
U.S. Cl. 46—61 **10 Claims**



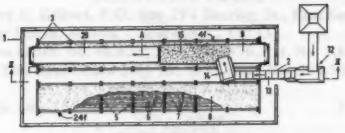
1. A combined top and yo-yo comprising
shaft means having opposed ends and a longitudinal axis between the opposed ends,
a pair of discs, each one of said pair of discs being concentrically and securely mounted to and between the ends of said shaft means and being disposed transversely of said shaft means in opposed and spaced relation to each other,
a string secured to and wound about said shaft means between said pair of discs,
opposed hub means disposed at the opposed ends of said shaft means and the pair of discs being interposed between said opposed hub means, and
one of said hub means being rotatably mounted about one end of said shaft means and being graspable to a user to support and control the position of said shaft means upon pulling said string means to effect rotation of said shaft means about its longitudinal axis.

3,936,975

BED FOR GROWING MUSHROOMS AND THE LIKE

Jan Gerrit de Winter, Enschede, Netherlands, assignor to Nicolon B.V., Enschede, Netherlands

Filed June 27, 1974, Ser. No. 483,542
Int. Cl.[2] A01G *1/04*
U.S. Cl. 47—1.1 9 Claims



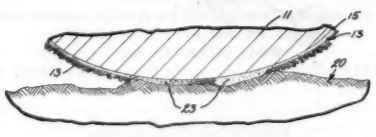
1. A cultivation bed for growing mushrooms and other crops, comprising: an air permeable, supporting floor; a first, permeable, lower web of a woven fabric supported on said floor; a second, permeable, superimposed, upper web of a woven fabric supported by said lower web; and a layer of growing medium supported by said upper web, there being means comprising the weaves of the fabrics from which said upper and lower webs are fabricated for making said upper web readily slidable relative to said lower web and thereby facilitating the application of growing medium to said second web and the removal of the growing medium therefrom, said webs being biochemically inert with respect to the growing medium and the crops grown therein and resistant to temperatures at least as high as 70°C., the upper of said two webs being substantially impermeable to the growing medium thereon, the top surface of the lower of said two webs being smoother than the bottom surface thereof so that, during relative displacement of the upper web relative to the lower web, the friction between the lower web and the supporting floor will be greater than the friction between the lower and upper webs, and the fabric of said lower web being of a more open weave than the fabric of said upper web.

3,936,976

ANTI-EROSION COATING OF SEEDS

Frederic E. Porter, Minneapolis, and Howard E. Kaerwer, Jr., Eden Prairie, both of Minn., assignors to Northrup, King & Company, Minneapolis, Minn.

Continuation-in-part of Ser. No. 322,013, Jan. 8, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,633
Int. Cl.[2] A01C *1/04*
U.S. Cl. 47—57.6 10 Claims



1. A process for preparing plant seeds for planting comprising the steps of:

a. coating the seeds with a substantially water-free tacky film which will not activate a water-activatable adhesive,

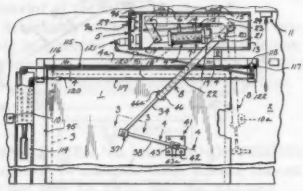
b. contacting said tacky film with a dry, solid, particulate water-activatable adhesive which is not activated by said tacky film, said adhesive being capable of forming pseudoplastic, viscoelastic, pituitous water solutions in 1 weight percent concentration in water, at least 98% by weight of the particles of said adhesive being small enough to pass a 10 mesh screen; said contacting step being continued until (1) said seeds are covered with an adherent outer layer of discrete granules of said adhesive as the outermost layer of the coating on said seeds, and (2) said seeds are a dry, free flowing mass of discrete seeds.

3,936,977

FLUID ACTIVATED LOAD OPERATOR

Arthur J. Runft, Mequon, and Walter E. Meyer, Saukville, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Dec. 27, 1973, Ser. No. 428,924
Int. Cl.[2] E05F *15/02*
U.S. Cl. 49—137 20 Claims



7. An automatic fluid activated operating apparatus for controlling a fluid motor means driven from a fluid supply means and a fluid exhaust means and having a pair of operating port means for supplying and exhausting of fluid from the motor means, comprising metering valve means connected to said port means to exhaust fluid from the motor means, said metering valve means including a plurality of passageway means between the port means and the exhaust means, at least a first of said passageway means including closure means for varying the effective size of said first passageway means, and said closure means being coupled to the motor means and selectively positioned in accordance with the relative position of said motor means after selected movement of the motor means to change the effective operation of said first passageway means to control the rate of change movement of the output of the motor means, said metering valve means includes a body portion including a first, second and third parallel passageway between a motor connection means and a supply-exhaust connection means, said body portion having mounting means for connection to the motor means, said first passageway means being adjustable and providing a first restricted flow passageway controlled by said closure means, said first passageway means being located between said second and third passageway means and including a cross-opening therethrough, said closure means being a piston-like element mounted in said cross-opening and coupled to the motor means for selectively positioning in accordance with the relative position of said motor means, the third of said passageways constituting a one-way flow passageway means permitting full transfer of fluid pressure from the supply-exhaust connection means to the motor connection means and restricting reverse flow, and the second of said passageways providing a continuous restricted flow passageway.

3,936,978

WINDOW HAVING A BELLOWS-TYPE OPENING MOVEMENT AND PERMITTING COMPLETE REVERSAL OF THE WINDOW-LEAF

Gerard Barras, Aubervilliers, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 17, 1974, Ser. No. 479,787
Claims priority, application France, June 22, 1973, 73.22974; Feb. 26, 1974, 74.06505
Int. Cl.[2] E05D *15/42*
U.S. Cl. 49—252 11 Claims

1. A window having a fixed rectangular windowcasing and a rectangular window-leaf movable in bellowslike manner

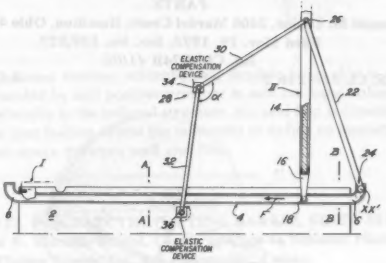
between open and closed positions and also being completely reversible relative to said window casing comprising:

leaf pivot means for forming a first axis of pivotal motion of said window-leaf with respect to said fixed window casing, said leaf pivot means being formed along a first side of said window-leaf, said first axis of pivotal motion being parallel to said first side and being movable in a direction parallel to itself;

a first arm pivotally secured by a first pivot means to a second side of said window-leaf which side is perpendicular to said first side;

a second arm pivotally secured by a second pivot means to a third side of said window-leaf which side is perpendicular to said first side;

said first and second pivot means defining a second axis of pivotal motion which permits complete reversal of said window-leaf;



said first and second arms being pivotally secured by third and fourth pivot means, respectively to opposite sides of said window casing near one end thereof;

said third and fourth pivot means defining a third axis of pivotal motion;

said second and third axes of pivotal motion being substantially parallel to said first axis of pivotal motion;

said third axis of pivotal motion substantially coinciding with said first axis of pivotal motion when the window is operated in bellows-like manner between open and closed positions;

said second and third axes of pivotal motion being maintained spaced apart by said first and second arms for a distance at least equal to one-half the length of the sides perpendicular to the first side; whereby complete reversal of said window-leaf may be achieved by rotation about said second axis of pivotal motion.

3,936,979

PARTICLE-RELEASING MOUNTING SYSTEM FOR THE BLADES OF BLASTING MACHINES

Bernard Fuerst, Grand Rapids, Mich., assignor to Benfur Engineering Company, Grand Rapids, Mich.

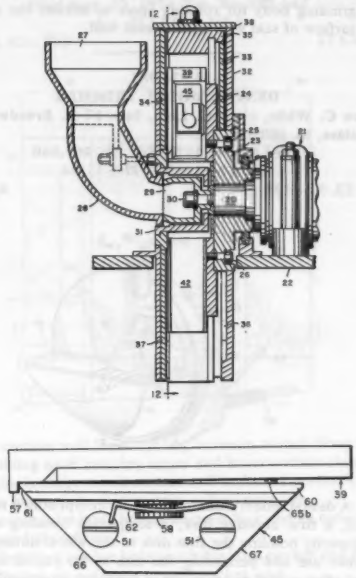
Filed Oct. 10, 1974, Ser. No. 513,758

Int. Cl.² B24C *5/06*

U.S. Cl. 51—9 R **4 Claims**

1. A blasting machine having a rotor including a rotatable shaft and a plate mounted on said shaft in a plane normal to the axis of rotation of said shaft, and also including at least one bracket secured to said plate and a blade detachably secured to said bracket in a position adjacent a radial plane containing said axis, said machine also including feeding means adapted to supply abrasive material to the central portion of said rotor for engagement with said blade, wherein the improvement comprises:

projection means on at least one of said bracket and said blade extending from the face of said one of said bracket



and blade opposite the other thereof and establishing a space between said opposite faces.

3,936,980

METHOD OF AND APPARATUS FOR GRINDING WIRE

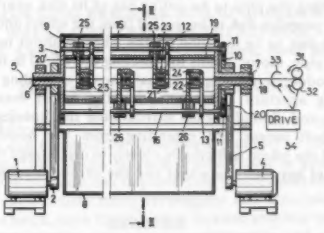
Harald Linnepe, Ludenscheid, Germany, assignor to Vereinigte Deutsche Metallwerke AG, Frankfurt am Main, Germany

Filed Aug. 15, 1974, Ser. No. 497,641

Claims priority, application Germany, Aug. 16, 1973, 2341437; Mar. 18, 1974, 2412842

Int. Cl.² B24B *5/38, 1/00*

U.S. Cl. 51—73 R **4 Claims**



1. An apparatus for grinding wire comprising:

means for displacing said wire along a straight path;

a frame journaled for rotation about an axis lying along said path;

an arm swingably mounted on said frame about a pivot offset from said axis;

a grinding body formed with a bore traversed by said wire and having an abrasive wall, said grinding body being rotatably mounted on said arm;

first driving means operatively connected with said frame for rotating same about said axis; and

second driving means operatively connected with said grinding body for rotating same to abrade the exterior surface of said wire against said wall.

3,936,981

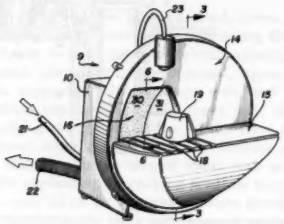
DENTAL MODEL TRIMMER

Velton C. White, c/o V.C. Labs, Inc., 17 N. Broadway, Des Plaines, Ill. 60016

Filed May 6, 1974, Ser. No. 467,060

Int. Cl.² B24B *27/00, 55/04*

U.S. Cl. 51—125 4 Claims



1. A dental model trimmer machine comprising a rotatable wheel, a first abrasive disk, a temporary bonding material temporarily bonding the first disk to the wheel during model trimmer use and permitting the disk to be peeled from the wheel after model trimmer use, a loadable, removable grinding material of first abrasive quality, a grit bonding material bonding the first grinding material to the disk and permitting controlled removal of some first grinding material during model trimmer use, a second abrasive disk, a temporary bonding material temporarily bonding the second disk to the wheel concentrically with the first disk during model trimmer use and permitting the disk to be peeled from the wheel after model trimmer use, a loadable, removable grinding material of second abrasive quality different from the first grinding material, a grit bonding material permanently bonding the second grinding material to the disk and permitting controlled removal of some second grinding material during model trimmer use, a wheel housing providing a single grinding access extending past all the abrasive disks, an elongated fluid distributing pipe extending over the face of the wheel-mounted disks to distribute a grinding fluid to all the disks, coupling means permitting the pipe to be swung out of its disk overlying position to permit a disk to be peeled from the wheel and to permit a fresh disk to be installed on the wheel without interference by the pipe, motor means for rotating the wheel in the housing at a model trimming speed, shaft means extending through a housing aperture and connecting the motor means to the wheel, and shroud means surrounding the housing aperture and shaft means and extending from the housing means toward the wheel sufficiently closely to discourage the passage of liquid between the wheel and the shroud means.

3,936,982

SHARPENING STONE FOR DEHORNERS

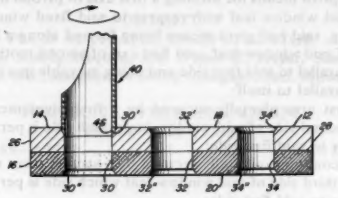
Delbert M. Crabtree, Stanford, Mont., assignor to Margaret Sisson, Lewistown, Mont., a part interest

Filed Nov. 21, 1974, Ser. No. 526,047

Int. Cl.² B24D *15/00*

U.S. Cl. 51—211 R 2 Claims

1. A sharpening stone for sharpening dehorners, said stone comprising an elongated body defined by a pair of elongated superposed plies of rigid abrasive materials graded as fine and coarse abrasives, the remote surfaces of said plies being substantially planar and parallel, said body having a plurality of longitudinally spaced bores of different diameters formed therethrough with the opposite ends of said bores opening



through said remote surfaces, said opposite ends of said bores including inwardly tapering counterbores.

3,936,983

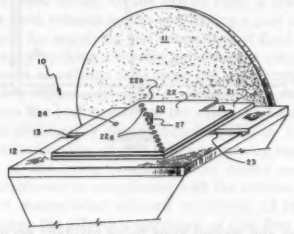
SANDING FIXTURE FOR PRODUCING CIRCULAR PARTS

Donald M. Taylor, 2400 Mardel Court, Hamilton, Ohio 45014

Filed Mar. 19, 1975, Ser. No. 559,927

Int. Cl.² B24B *41/06*

U.S. Cl. 51—216 T 4 Claims



1. A fixture for producing circular parts for use in conjunction with an abrasive wheel or the like; said fixture consisting essentially of; a base including means for positioning said fixture a fixed distance from said abrasive wheel, a pivot pin joining said base and a platen for pivotal movement, said platen having a plurality of work-mounting pin locations with a work-mounting pin positioned in one of said locations for mounting a workpiece center for rotation thereupon, and positive stop means which limits the degree of pivotal movement of the platen with respect to the base.

3,936,984

INSULATED AIR INFLATED STRUCTURES

Stephen Yando, 315 W. 57th St., Apt. 16A, New York, N.Y. 10019

Filed Oct. 28, 1971, Ser. No. 193,273

Int. Cl.² E04B *1/345*

U.S. Cl. 52—2 16 Claims

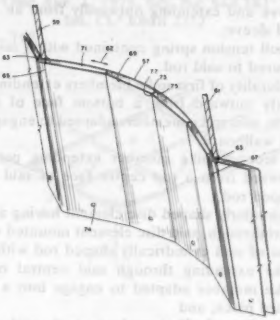
1. An air inflated shell-like structure for enclosing a volume of space therein, said structure having insulated walls which curtail heat flow from or into said enclosed volume, comprising:

a flexible outer skin defining the exterior shell of said structure;

means for providing positive air pressure within said enclosed volume of said structure for maintaining said skin in a fully expanded condition, the geometry of said skin being such that in said expanded condition, concavities are formed by said skin defining said shell wall; and

a thin plastic film secured at the outer surface boundaries of said concavity, and secured to the shell wall within said boundary, said thin film being continuous across said boundary and the surface area of the film being less than

surface of said concavity within said boundary, the space between said outer skin and thin plastic film communicating by openings in said plastic film with the said enclosed volume of said structure and being at the pressure of said



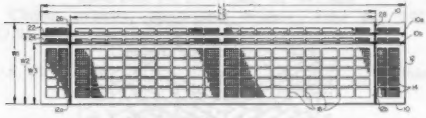
enclosed volume, whereby said flexible outer skin is expanded by said positive pressure in said enclosed volume, whereby in the inflated structure, the said film is extended in taut fashion across the concavity to define an insulating air space between wall and film.

3,936,985

PANEL FOR ELECTROPLATING BARREL SIDEWALL

Alfred N. Marulli, Bristol, Conn., assignor to National Plastics & Plating Supply Co., Inc., Terryville, Conn.

Filed Feb. 20, 1975, Ser. No. 551,099
Int. Cl.² E04C *2/42*
U.S. Cl. 52—98 **9 Claims**



1. A panel for use in constructing polygon shaped barrels of differing sizes, said panel comprising:

a. an integrally molded rectangular frame portion defining the periphery of said panel and having marginally extending sides of generally square cross section,

b. an outer grid portion within said frame portion and integrally molded thereto, said outer portion including longitudinally extending ribs and intersecting cross ribs defining relatively large rectangular openings therebetween,

c. an inner grid portion within said frame portion and integrally molded to said outer portion and to said frame, said inner portion including longitudinally extending ribs and intersecting cross ribs corresponding in thickness and in location to said ribs defining said outer grid portion, and each rectangular opening defined between said inner grid openings being further divided by longitudinally and laterally extending partitions defining relatively small rectangular openings, said partitions integrally molded to said ribs defining said large openings,

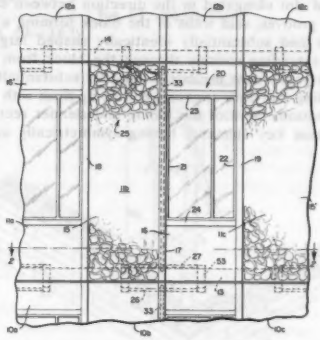
d. at least one integrally molded brace oriented parallel one of said marginal sides and spaced therefrom, said brace having a cross sectional configuration similar said frame side and a predetermined line defined adjacent said brace and in the space between said brace and said parallel side to provide a slightly smaller size panel when said panel is severed along said line.

3,936,986

STRUCTURE AND METHOD FOR MOUNTING CURTAIN WALLS

John F. Steel, 1469 N. Ocean Blvd., Palm Beach, Fla. 33480

Filed Sept. 23, 1974, Ser. No. 508,643
Int. Cl.² E04B *2/8 8*
U.S. Cl. 52—235 **17 Claims**



1. A curtain wall for mounting between spaced floor slabs of a building each carrying upper and lower anchor elements to hangingly support said curtain wall to form a portion of the building outer shell, said curtain wall comprising:

a. a rectangular body having an inner face and an outer face spaced therefrom;

b. at least two anchor boxes each having a pocket and a wall including an entrance to said pocket; and

c. frame means disposed between said faces of said body providing both structural stability to said body and a fixed mounting for said anchor boxes, at least one of said anchor boxes being disposed near the top of said body and at least one of said anchor boxes being disposed near the bottom of said body with each said anchor box disposed in cooperative relation with a respective one of said upper and one lower anchor elements on adjacent floor slabs, each said anchor box supported by said frame means with said entrance to said pocket substantially in the plane of said inner face, and each said anchor element adapted to be received through a respective one of said entrances to cooperate in said pocket for hanging mounting of said curtain wall on said anchor elements.

3,936,987

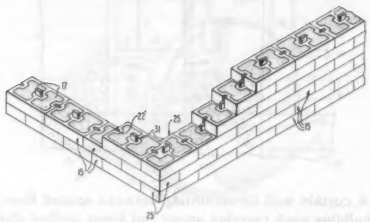
INTERLOCKING BRICK OR BUILDING BLOCK AND WALLS CONSTRUCTED THEREFROM

Edward L Calvin, 181 Country Club Drive, Rock Hill, S.C. 29730

Filed Jan. 13, 1975, Ser. No. 540,339
Int. Cl.² E04C *1/10*
U.S. Cl. 52—309 **3 Claims**

1. In a wall construction including a plurality of courses of blocks, and the blocks in each course being in end-to-end abutting relationship, the improvement which comprises each block in each course being rectangular and dimensioned to simulate a brick, each block having forward and rear webs and end webs joined in right angular relationship and a center front-to-back web parallel with the end webs and joined with said forward and rear webs, said center web having an enlargement substantially midway between the forward and rear webs, said end webs having interior side enlargements spaced from and opposing said enlargement of the center web, all of said webs and said enlargements being continuous in a vertical direction and extending from the top face to the bottom face of the block, the exterior faces of said end webs provided midway between the forward and rear webs with narrow con-

stant width grooves which extend vertically and continuously between the top and bottom faces of said block and opening through said top and bottom faces, said center web enlargement having a centrally located rectangular cross section slot formed therein vertically and being aligned laterally with said grooves and being of substantially equal width with the grooves in the front-to-back direction, said slot having a bottom wall substantially at the center of vertical thickness of the block, said slot elongated in the direction between said end webs and grooves, said webs of the block forming a pair of equal size and substantially identically shaped large core openings extending entirely through the block from top-to-bottom thereof, foam insulation material substantially completely filling said core openings and being flush with the flat top and bottom faces of the block, and slender rectangular cross section key elements having symmetrically arranged



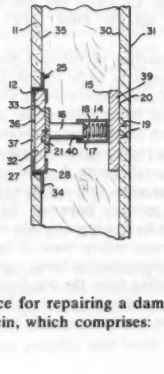
tapering wedge-like end portions and full thickness intermediate portions engaging snugly in said slots and grooves of all of the blocks and all of the courses to thereby firmly mechanically interlock the courses in properly registering relationship while interlocking the blocks of the courses in properly aligned relationship, said key elements having a length in the vertical direction during use to bottom in said slots with substantially half of their lengths projecting above the tops of the slots for entry into opposing registering pairs of said end web grooves of adjacent blocks in the courses, thin layers of epoxy cement bonding together the courses of blocks in the wall construction, and each block being chamfered on its upper horizontal corners and both end vertical corners at its forward and rear sides, said chamfers simulating brick wall mortar joints in said wall construction and said chamfers rendering the blocks reversible in the front-to-back direction.

3,936,988

REPAIR DEVICE FOR RESTORING A DAMAGE DRY WALL BOARD

Nicholas M. Miceli, Woodside, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Dec. 16, 1974, Ser. No. 532,991
Int. Cl.² E02D *37/00*
U.S. Cl. 52—514 **2 Claims**



1. A repair device for repairing a damaged dry wallboard having a hole therein, which comprises:

a. a wallboard support member consisting of:
   1. a circular bottom base plate,
   2. a cylindrically shaped sleeve affixed perpendicularly onto a top center face of said circular bottom base plate,
   3. a cylindrically shaped rod slidably contained in said sleeve and extending outwardly from an open end of said sleeve,
   4. a coil tension spring contained within said sleeve and secured to said rod,
   5. a plurality of first spike members extending perpendicularly outward from a bottom face of said circular plate, said spike members adapted to engage into a rear dry wallboard,
   6. a second spike member extending perpendicularly outward from a top center face of said cylindrically shaped rod,
   7. a circularly shaped disc element having a central hole therethrough, said disc element mounted onto said top base of said cylindrically shaped rod with said second spike extending through said central opening, said spike member adapted to engage into a cutout wallboard piece; and

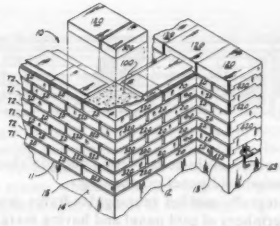
b. a plurality of clip members, each said clip member adapted to engage said cutout wallboard piece and adapted to engage an inside surface of said damaged dry wallboard.

3,936,989

INTERLOCKING BUILDING BLOCK

Norman Lee Hancock, 10439 Garibaldi St., St. Louis, Mo. 63122

Filed Feb. 10, 1975, Ser. No. 548,882
Int. Cl.² E04B *2/56*; **E04C** *1/04*
U.S. Cl. 52—593 **14 Claims**



1. A building block comprising:

a. an upper side including a longitudinally extending rib having laterally spaced first and second inclined faces and a transverse face extending therebetween, the intersection between said transverse face and said first inclined face defining an acute included angle and the intersection between said transverse face and said second inclined face defining an obtuse included angle,

b. a lower side including a longitudinally extending groove having laterally spaced first and second inclined faces and a transverse face extending therebetween, the intersection between said transverse face and said first inclined face defining an acute included angle and the intersecion between said transverse face and said second inclined face defining an obtuse included angle said groove receiving the rib of a compatible block in interfitting relation, and

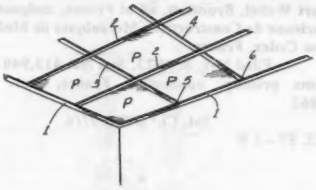
c. opposed front and rear sides and opposed ends.

3,936,990

CEILING PANEL TRIM MOUNTING MEANS

David H. Garrison, Jr., deceased, late of Boco Raton, Fla., and by Richard J. Alfieri, executor, 930 N. Federal Highway, Pompano Beach, Fla. 33062

Filed Apr. 1, 1975, Ser. No. 564,161
Int. Cl.² E04B 5/52
U.S. Cl. 52—717 6 Claims



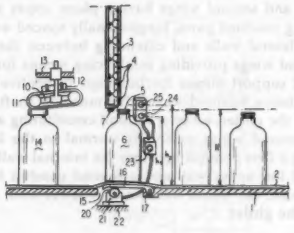
1. In suspended ceiling construction of the class described, in combination, grid members for supporting ceiling panels, said members having a normally exposed surface and at least one generally horizontal flange to support ceiling panels thereon, a trim body to cover said exposed surface, said body having a recess therein including spaced sides, and trim body mounting means comprising a series of clips, each having a portion extending over the said flange and a section seated in the recess whereby to engage at least one side thereof to maintain the trim body in juxtaposition with said normally exposed surface to cover the same.

3,936,991

BOTTLE STOPPERING APPARATUS

Jean Deix, Chalon-sur-Saone, France, assignor to Le Bouchage Mecanique, Paris, France

Filed Feb. 14, 1974, Ser. No. 442,620
Claims priority, application France, Feb. 22, 1973, 73.06260
Int. Cl.² B65B 57/02, 7/28
U.S. Cl. 53—76 3 Claims



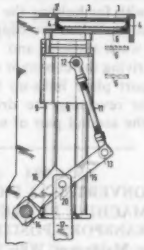
1. Bottle stoppering apparatus including stopper delivery means, stopper driving means, means to carry bottles in a substantially horizontal direction beneath said delivery and driving means in succession, means including three photoelectric detectors to measure the height of bottles on said carrying means upstream of said delivery means, one of said detectors detecting the approach of a bottle, another detecting insufficient height for the bottle and a third detecting excess height for the bottle, and means to adjust the vertical separation of said delivery and carrying means as a direct function of bottle height measured, said adjusting means comprising a servomechanism coupled to adjust the vertical position of said carrying means at a location beneath said delivery means.

3,936,992

MACHINE FOR FILLING CARRYING TRAYS WITH OBJECTS DISPOSED IN GROUPS

Everhard Bauer, Oberer Frankfurter Weg 21, 479 Paderborn, Germany

Filed May 8, 1974, Ser. No. 468,169
Claims priority, application Germany, May 10, 1973, 2323728
Int. Cl.² B65B 35/30
U.S. Cl. 53—162 9 Claims



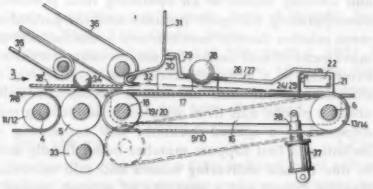
1. A machine for loading an assembly of articles such as cans or the like onto trays, comprising in combination, a receptacle having a removable base and a side wall therefor for receiving said assembly of articles, means associated with said receptacle for guiding said assembly of articles into said receptacle in supported relationship on said base, means for supporting a tray in underlying relationship with said base, means for moving a tray onto said tray supporting means into said underlying relationship with said base whereby said assembly of articles is deposited in said tray upon removal of said base, vertically movable tray support means movable into an upper position beneath said receptacle for supportedly receiving a tray loaded with said assembly of articles upon removal of said base and into two vertically spaced lower positions and drive means for moving said support means reciprocally between said upper position and selectively into either one of said lower positions for removal of a single loaded tray from said support means in a single-stage operation or into both of said two lower positions successively for receiving a second loaded tray in stacked relationship with the first loaded tray and for removal of said stacked trays from said support means in a two-stage operation.

3,936,993

ENVELOPE FILLING MACHINE

Wilfried Dorer, Rebberg, Germany, assignor to Mathias Bauerle GmbH, St. Georgen, Black Forest, Germany

Filed July 5, 1974, Ser. No. 485,944
Int. Cl.² B65B 7/20; B65G 47/52
U.S. Cl. 53—266 A 13 Claims



11. An apparatus for advancing sheet material between a feed and a filling station defining a first pair of work stations and between the filling and a discharge station defining a second pair of work stations in a processing machine wherein

the first and second pairs of work stations are at separate locations, comprising:

a support plate linking said first pair of the work stations, said support plate being an integrated unit and adapted to pivot about one end thereof at one of the work stations;

conveyor means including an endless belt having an upper run thereof overlying the support plate for advancing sheet material;

means for pivoting the support plate to link the second pair of work stations;

retainer means pivotally mounted on the support plate and movable therewith for holding the sheet material against the conveyor means when the support plate links-up the second pair of work stations; and

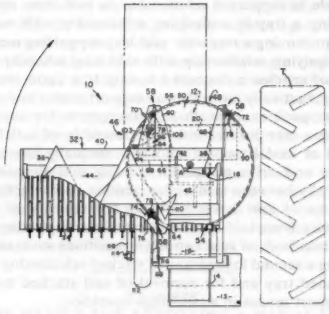
drive means for driving the conveyor means in one direction when the support plate links-up the first pair of work stations and for reversing the drive when the support plate links up the second pair of work stations.

3,936,994

MEANS FOR CONVERTING A PICKUP ON A CROP TREATING MACHINE BETWEEN FIELD AND TRANSPORT POSITIONS

Frans Henri Mortier, Maldegem; Willy Rene Evarist Dekeyser, Vladslo, both of Belgium, and Loren Gage Sadler, Stevens, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Mar. 28, 1974, Ser. No. 455,699
Int. Cl.² A01D 75/22
U.S. Cl. 56—228 **15 Claims**



1. In machine for treating crop material during movement across a field and being of the type which includes a frame, crop material receiving and treating means mounted on said frame and means for delivering said crop material from the field to said receiving and treating means, an improved means for converting said machine between field and transport positions which comprises:

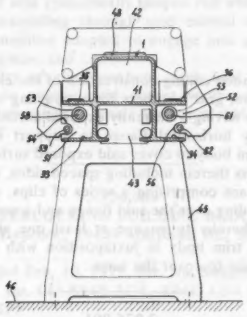
means supporting said delivering means on said receiving and treating means in an operating field position, in a non-operating transport position and for pivotal movement relative thereto between said positions, said pivotal movement of said delivering means being within a plane extending in a generally transverse relationship to the direction of machine movement across the field and about a pivotal axis from which said supporting means is disposed at a spaced location, said supporting means including a first support member being fixedly mounted to one of said delivering means and said receiving and treating means and a plurality of second, spaced apart support elements mounted to the other of said delivering means and said receiving and treating means and movably coupled to said first support member at locations radially spaced from said pivotal axis for supporting said delivering means on said receiving and treating means and for allowing relative movement between said first support member and said plurality of second support elements in pivotally moving said delivering means relative to said receiving and treating means between said field and transport positions.

3,936,995

TEXTILE MACHINE FRAMES

Regis Laflaquiere; Radovan Janousek, both of Mulhouse, and Albert Wettel, Brunstatt, all of France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Nov. 8, 1973, Ser. No. 413,948
Claims priority, application France, Nov. 10, 1972, 72.39862
Int. Cl.² D01H 1/16
U.S. Cl. 57—1 R **2 Claims**



1. A frame for a textile machine such as a spinning frame, a twisting machine or rewinding machine which includes a series of similar stations, said frame comprising a central longitudinally extending body solely defined by lateral, upper and lower walls providing a hollow girder of rectangular cross section, first wings constituting extensions of the lower wall extending normal to the lateral walls, second wings located between said first wings and the upper wall extending normal to the lateral walls in parallel relationship to the first wings, said first and second wings having plane upper surfaces for supporting machine parts, longitudinally spaced webs integral with the lateral walls and extending between the first wings and second wings providing reinforcing means for the lateral walls and support means for bearings, respectively, with the bearings being adapted to receive machine shafts extending axially of the girder, an internal wall constituting an extension of said second wings extending normal to the lateral walls providing a first conduit between the internal wall, the lateral walls and the upper wall and a second conduit between the internal wall, the lateral walls and the lower wall, and support legs for the girder.

3,936,996

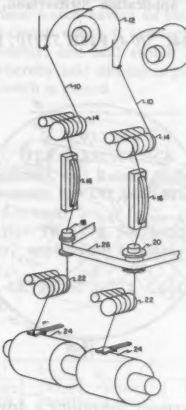
METHOD AND APPARATUS FOR PRODUCTION OF FALSE TWIST TEXTURED COMPOSITE YARN

Heinz Schiffer, Brussels, Belgium, assignor to Amcel Europe, S.A., Brussels, Belgium

Continuation of Ser. No. 186,785, Oct. 5, 1971, abandoned. This application Nov. 8, 1973, Ser. No. 414,087
Int. Cl.² D02G 1/04, 3/04
U.S. Cl. 57—34 HS **11 Claims**

4. A process for simultaneously and independently false twist texturing each yarn member forming pairs of multifilamentary thermoplastic yarns, each member of said pair being of a different chemical composition than the other, on a single multiposition false twist machine fitted with a multiplicity of twister means associated individually with said multipositions,

said twister means associated individually with said multipositions, said twister means being driven by a common belt, said process comprising texturing said yarn members of respective pairs of yarns at differential twist levels for each of the different chemically composed yarn members, by running each of



said member of said pairs of yarns through individual twister means at adjacent texturing stations, the twister members of said individual adjacent twister means having modified belt contacting surfaces constituted by circular cross sections of different diameter.

3,936,997

DEVICE FOR TAKING UP THE THREAD IN TEXTILE MACHINES

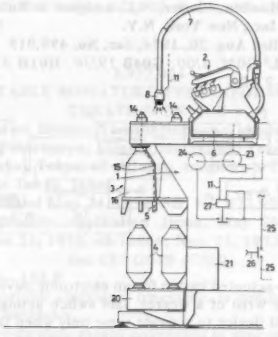
Angelo Marzoli, Bergamo, Italy, assignor to F.LLI Marzoli & C. S.p.A., Palazzolo Sull'Oglio (Brescia), Italy

Filed Aug. 8, 1974, Ser. No. 495,840

Claims priority, application Italy, Aug. 10, 1973, 27778/73

Int. Cl.² D01H *15/00*

U.S. Cl. 57—34.5 **3 Claims**



1. A thread taking-up device for textile machines comprising a drawing system, a wind-up unit and a conduit for transferring the thread from the drawing system to the wind-up unit, said device comprising a bell of electrically insulated material, a flexible tube connecting the bell to an aspiration unit, an electrically conductive spring housed within said bell and protruding outwardly therefrom and an electrical control for the aspiration unit, said control being electrically connected to said spring for starting operation of the aspiration unit when the spring is brought into contact with metallic means.

3,936,998

SPINNING OR TWISTING MACHINE

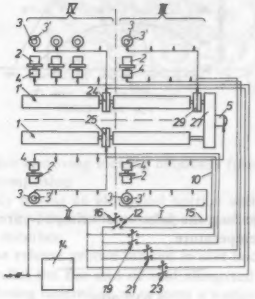
Horst Wolf, Albershausen, Germany, assignor to Zinser Textilmaschinen GmbH, Ebersbach, Germany

Filed May 22, 1974, Ser. No. 472,504

Claims priority, application Germany, May 22, 1973, 2325888

Int. Cl.² D01H *1/20, 1/22, 1/24, 1/244*

U.S. Cl. 57—100 **2 Claims**



1. In a spinning, twisting or spooling machine, especially a draw-twisting machine, which includes a plurality of thread processing stations, each of which includes a thread feed roller and a thread draw roller, where said rollers are driven by a plurality of individual synchronous motors whose AC drive current is produced by a common frequency generator, the improvement comprising: switching means and associated connecting lines to permit the separate actuation of the electric drive motors within a selected sub-group of said plurality of thread processing stations.

3,936,999

FALSE TWIST-CRIMPED POLYESTER YARNS PRODUCTION

Morio Ikeda, and Mamoru Tsumoto, both of Ibaraki, Japan, assignors to Teijin Ltd., Osaka, Japan

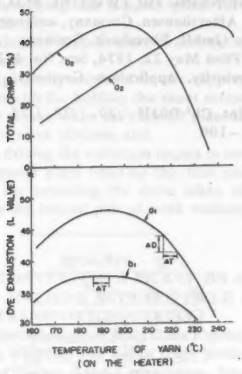
Continuation-in-part of Ser. No. 131,242, April 5, 1971, Pat. No. 3,797,221. This application Dec. 19, 1973, Ser. No. 425,995. The portion of the term of this patent subsequent to Mar. 19, 1991, has been disclaimed.

Int. Cl.² D02G *1/02*

U.S. Cl. 57—157 TS **3 Claims**

1. A process for producing a false twist-crimped polyester yarn which comprises false twisting undrawn polyester multifilament yarn obtained by melt-spinning at a speed of 2500–5000m/min., having a birefrigence (Δn) of 0.030–0.145 and a density of not greater than 1.3720, while heat-setting said yarn in the twisted state at a first temperature of 160°–210°C, at a draft (dr) expressed by the equation:

$$-150(\Delta n) + 17 \leq dr \leq 0.9 \times 10^4(\Delta n^2) - 29 \times 10^2(\Delta n) + 248$$



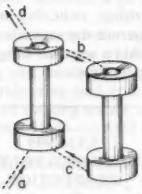
and then subjecting the false twist-crimped yarn to a second heat-setting temperature.

3,937,000

CONTINUOUS BI-COMPOUND ACRYLIC BULKY YARN AND THE METHOD OF THE PRODUCTION OF SAME

Franco Cognigni, Cesano Maderno, and Silvano Cesca, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Filed Sept. 15, 1972, Ser. No. 289,230
Claims priority, application Italy, Sept. 16, 1971, 28708/71; July 7, 1972, 26731/72
Int. Cl.² D02G 1/02
U.S. Cl. 57—157 TS 5 Claims



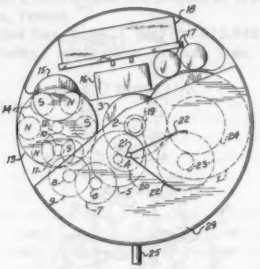
1. Method for the production of a bulky acrylic bi-compound, continuous yarn consisting of a pair of acrylic polymeric components differing from each other in some of their properties, characterized by from 4 to 15 waves per centimeter and a crimping rate ranging from 5% to 20%, wherein the yarn is drawn, the drawn yarn is passed through a first oven heated to a temperature in the range from 130°C to 230°C, is then subjected to a false twist by means of a rotating spindle, is then passed into a second oven, heated to a temperature of from 120°C to 200°C, and is then wound on a holder.

3,937,001

WATCH MOVEMENT DRIVEN BY A SPRING AND REGULATED BY AN ELECTRONIC CIRCUIT

Jean-Claude Berney, Chemin de Fontadel 15, Prilly, Vaud, Switzerland

Filed Nov. 20, 1973, Ser. No. 417,588
Claims priority, application Switzerland, Nov. 21, 1972, 16918/72
Int. Cl.² G04C 3/04; F16H 57/10; H02P 5/00
U.S. Cl. 58—23 D 10 Claims



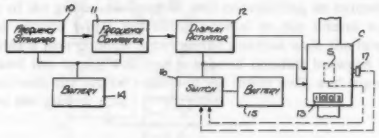
1. A watch movement comprising a drive means, a time-wheel mechanism driven by said drive means, a generator coupled to said drive means via at least a portion of said time-wheel mechanism and with substantial gear reduction, said generator including means for producing a.c. voltage at a frequency of operation F_G, and an electronic regulating circuit connected to said generator, said circuit comprising an oscillator means for producing a precise reference frequency FR, a comparator having inputs receiving frequencies F_R and F_G to compare the same, and a charging means connected to the comparator and the generator to supply current to the generator when $F_G > F_R$ to brake the generator until $F_G = F_R$ and thereby provide a regulated operation of said time-wheel mechanism.

3,937,002

SOLID STATE, BATTERY OPERATED ELECTRONIC WATCH HAVING ARM-ACTUATED SWITCH

Egbert Van Haaften, Closter, N.J., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Aug. 20, 1974, Ser. No. 499,015
Int. Cl.² G04C 3/00; G04B 19/30; H01H 35/02
U.S. Cl. 58—23 BA 11 Claims



1. An arm-actuated switch for an electronic device which is borne on the wrist of a wearer, said switch acting to close a circuit in said device to activate same only when the wearer's arm is made to undergo a predetermined sequence of motions, said switch comprising:

A. a pair of spaced contacts which when interconnected close said circuit;

B. a conductive shorting bridge having a pair of flexible tines symmetrically disposed with respect to said contacts, each tine in its neutral position being adjacent to but out of engagement with a respective contact, and

C. a pair of swingable mallets pivoted on an axis normal to the axis of symmetry of said tines and so disposed with

respect to said tines that the mallets are capable of being retracted and then swung to strike the tines simultaneously with sufficient force to bend the tines to cause them to engage the contacts and close the circuit only when the wearer moves his arm so that it undergoes said predetermined sequence of motions.

3. A switch as set forth in claim 2, wherein said device is a solid-state electronic watch having an electro-optical display having a control circuit which is connected to a battery for powering said display, and said switch is included in said control circuit whereby said display is provided with power only when said switch is closed.

3,937,003

ELECTRIC CLOCK

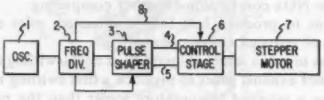
Dieter Busch, Wollstadt, and Roland Sudler, Frankfurt, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Nov. 18, 1974, Ser. No. 524,878

Claims priority, application Germany, Nov. 28, 1973, 2359142

Int. Cl.² H02K 59/02; G04C 3/00

U.S. Cl. 58—23 D 8 Claims



1. In an electric clock comprising:

A. oscillator means (1) for providing a substantially fixed frequency oscillating electrical signal,

B. frequency-divider means (2) responsive to the fixed frequency oscillating electrical signal for providing a reduced frequency oscillating electrical signal,

C. a stepper motor (7) for driving hands of the clock, and

D. control means responsive to the reduced frequency oscillating electrical signal for driving the stepper motor,

the improvement wherein the control means comprises:

E. pulse generating means responsive to the reduced frequency signal for generating a train of pulses at said reduced frequency, and

F. decay-time means (20, 21, 31) for lengthening the decay-time of the trailing edge of each pulse in said train of pulses.

3,937,004

PORTABLE MINIATURE TYPE INFORMATION TREATING DEVICE

Minoru Natori, Hidaka; Yasushi Nomura, Tokorozawa; Fukuo Sekiya, Tokorozawa; Shigeru Morokawa, Tokorozawa, and Akira Nakai, Tokyo, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed May 24, 1974, Ser. No. 472,958

Claims priority, application Japan, May 28, 1973, 48-59593; June 21, 1973, 48-70066; Nov. 15, 1973, 48-128550

Int. Cl.² G04B 47/00

U.S. Cl. 58—152 B 3 Claims

1. In a portable electronic timepiece, in combination:

a crystal oscillator;

frequency-dividing means connected to said oscillator;

counting means stepped by said frequency-dividing means;

code-conversion means connected to said counting means for generating time-indicating signals;

electro-optical display means connected to said code-conversion means for energization by said time-indicating signals in a display recurrent cycle of at least 12 hours;

normally deactivated receiving means for external signals;

timing means controlled by said frequency-dividing means for periodically activating said receiving means several times during said display cycle for a limited time interval; and

sound-emitting means responsive to external call signals upon activation of said receiving means by said timing means.

3,937,005

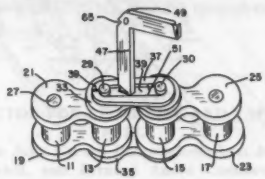
KEY FOR REMOVING LOCKING MEMBERS FROM DRIVE CHAINS OR THE LIKE

Raymond Becker, 3754 Ramsey Court, El Sobrante, Calif. 94803

Filed Feb. 18, 1975, Ser. No. 550,267

Int. Cl.² B21I 21/00

U.S. Cl. 59—7 4 Claims



1. A key for removing locking members from drive chains or the like comprising

a rigid body having an elongated portion with a flat end of a size to fit within the central opening of the drive chain locking member,

at least one release groove formed in said body adjacent to and parallel the flat end of said elongated portion, said groove being tapered so as to form a wedge with said flat end whereby, when the flat end of said elongated portion of said body is placed within the central opening of said locking member and said flat end is held against the chain link underlying said locking member, the key can be rotated to permit both the release groove to engage one internal edge of the locking member within the central opening, and the side of the body opposite the release groove to engage the opposite internal edge of the central opening whereby the wedge formed by said release groove causes the side of the locking member engaged by the release groove to separate and lift from its locked position when the key is further rotated, and

a reset groove formed in said body such that when said locking member is loosely positioned over suitably spaced locking member sprocket shafts said reset groove can engage one of the internal edges of said locking member within its central opening permitting the key to force said locking member into locking engagement with said sprocket shafts by rotating said key within said central opening while the key is held firmly in contact with the surface of the underlying chain link.

3,937,006

METHOD AND MEANS FOR OBTAINING STAPLES OR THE LIKE

Rolf Erik Lindqvist, Pionjargat. 50, 582 65 Linkoping, Sweden

Filed Dec. 10, 1973, Ser. No. 423,306

Claims priority, application Sweden, June 9, 1972, 7603/72

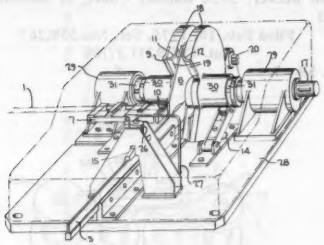
Int. Cl.² B21D 53/46

U.S. Cl. 59—76 8 Claims

1. A method to produce staples with parallel legs comprising the following steps:

arranging a plurality of wires of desired cross section in a side-by-side relationship in a plane and adhering the wires to each other to form a mat or strip, moving the mat or strip which is obtained stepwise in the longitudinal direction of the wires, the length of the steps being chosen as

desired, cutting off the portion of the mat which has been moved in this way from the rest of the mat while the central portion of said portion is kept fixed, and is given a somewhat concave, blunt V-shaped bending on the upper side, bending the side legs of the cut portion of the mat downwards, principally to mutual parallel positions,



moving the cut and bent portion of the mat along a bar, pressing both ends of the central portion of the bent portion of the mat downwards over a ridge, shaped as a blunt V, to make its leg to converge towards their free ends, and interrupting the pressing when the legs have achieved a position, from which they will become parallel by the resilience of the material.

3,937,007

COMBUSTION CHAMBER AND PROCESS UTILIZING A PREMIX CHAMBER OF A POROUS CERAMIC MATERIAL

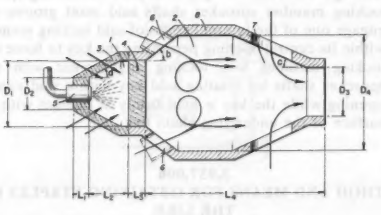
Gunter Kappler, Munich, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Germany

Filed May 28, 1974, Ser. No. 474,026

Claims priority, application Germany, May 25, 1973, 2326680

Int. Cl.² F02C 7/22

U.S. Cl. 60—39.06 **5 Claims**



1. Combustion chamber for use in gas turbines, comprising a flame tube, a premix chamber located at the upstream end of the flame tube, and fuel injector means for injecting fuel directly into said premix chamber, wherein the premix chamber comprises an entirely permeably walled chamber which includes an intervening diaphragm attached to the upstream end of the flame tube, wherein combustion occurs, immediately after the mixture issues from the premix chamber, in a combustion zone beginning directly at the intervening diaphragm.

3,937,008

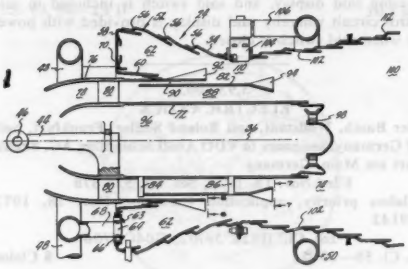
LOW EMISSION COMBUSTION CHAMBER

Stanley J. Markowski, and Richard S. Reilly, both of East Hartford, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 18, 1974, Ser. No. 534,018

Int. Cl.² F02C 3/24; F02M 23/00, 31/00

U.S. Cl. 60—39.06 **25 Claims**



1. A low NOx combustion chamber comprising:

A. means to produce hot, fully combusted, pilot exhaust gases of reduced oxygen content,

B. means to mix a selected quantity of cool, swirling air with the pilot exhaust gases to produce a first swirling mixture having a selected temperature lower than the pilot exhaust gases but above the vaporization temperature of the fuel to be utilized in the combustion chamber, and of reduced oxygen content so that the first swirling mixture has an ER less than 1,

C. means to inject atomized fuel into the first swirling mixture in selected quantity to produce a second swirling mixture of fuel and air of reduced oxygen content so that the second swirling mixture has a first ignition delay time to prevent autoignition of the atomized fuel droplets, said second swirling mixture also having a selected temperature to vaporize the fuel so that said second swirling mixture is a vaporized, swirling fuel-air mixture having a reduced oxygen content to produce autoignition at the culmination of the first time delay, and

D. means to mix a selected quantity of swirling combustion air with the second swirling mixture to effect molecular mixing between the fuel and air since both the second mixture and combustion air are swirling, and in selected quantity to produce a third swirling, vaporized fuel-air mixture of oxygen level greater than that of said second mixture to effect a new and reduced ignition delay time so as to autoignite the third mixture at an ER less than 1 and at a time sooner than the expiration of the first ignition delay time to thereby reduce the dwell time of the engine air at NOx creating temperature.

3,937,009

TORQUE-JET ENGINE

Howard Coleman, 1312 Briarcliff, Austin, Tex. 78723

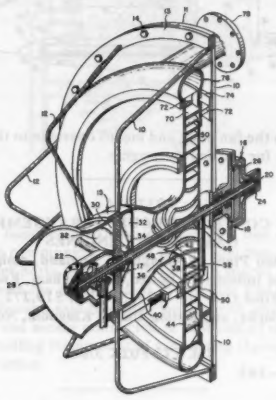
Filed Sept. 24, 1974, Ser. No. 508,849

Int. Cl.² F02C 3/16

U.S. Cl. 60—39.35 **15 Claims**

1. A rotary internal combustion reaction engine having air inlet, fuel injection means and an exhaust outlet for the products of combustion produced in the engine comprising a rotating air compressing means for receiving air from said inlet, said compressing means having a passage extending around at least 360° in the direction of its rotation, a rotating combustion chamber integral with and concentrically disposed with respect to said compressing means, said combustion chamber having an infeed throat at its inner end to receive compressed air from said compressor, said combustion chamber extending outwardly, from said throat, fuel injection means at said throat

to feed fuel into the combustion chamber, igniter means at said throat to initiate combustion of the fuel and air at said throat, a common wall means for defining a portion of said compressing means and said combustion chamber to provide for a heat exchange between the infeeding compressed air and heat from the combustion chamber, reaction nozzle means near the outer end of the combustion chamber and rotating therewith forming an exhaust means for allowing the products of combustion to issue from the combustion chamber whereby to drive said compressing and combustion chamber means to



rotate about a common axis, fixed frame means for supporting said air compressing and combustion means, fixed deflector blades carried on said frame concentrically with respect to said axis and said reaction nozzle means to redirect the flow of exhaust gases issuing from said nozzle means, turbine means disposed concentrically outside of said deflector blades to be driven by the exhaust gas flowing from said combustion chamber, and rotating driven means operatively connected to said reaction nozzle means and said turbine means to deliver power from the engine.

3,937,010

FUEL OXIDIZER

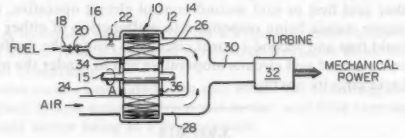
Katuaki Kosaka, Tokyo; Zene Ueno, Fuchu, and Tadahiko Nagaoka, Tokorozawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 25, 1973, Ser. No. 409,678

Claims priority, application Japan, Nov. 27, 1972, 47-11873

Int. Cl.² F02C *3/20*

U.S. Cl. 60—39.46 R **14 Claims**



1. A fuel oxidizer comprising a housing defining therein a chamber; an oxygen absorbable porous wheel rotatable within said chamber, said wheel being made of an oxygen absorbable material which alternately absorbs and releases oxygen in dependence on certain factors; a fuel inlet opening into said chamber adjacent to an end face of said wheel; an air inlet opening into said chamber adjacent to said end face of said wheel, said air inlet being spaced apart from said fuel inlet; an oxidized gas outlet opening into said chamber adjacent to an opposite end face of said wheel, said oxidized gas outlet being substantially axially aligned with said fuel inlet, said oxidized gas outlet feeding into means which produce mechanical power by being supplied with oxidized gas from said oxidized gas outlet; a residual gas outlet opening into said chamber adjacent to said opposite end face of said wheel, said residual gas outlet being substantially axially aligned with said air inlet; said wheel being operative to absorb oxygen, in a portion thereof which lies between said air inlet and said residual gas outlet opening, from air introduced into said chamber through said air inlet and allow residual gas to pass out of said chamber through said residual gas outlet; and said wheel being operable to allow fuel introduced into said chamber through said fuel inlet to be oxidized by said absorbed oxygen therewithin when said portion of said wheel is rotated to a position between said fuel inlet and said oxidized gas outlet opening and allow said oxidized fuel to pass out of said chamber through said oxidized gas outlet.

3,937,011

FUEL INJECTOR FOR ATOMIZING AND VAPORIZING FUEL

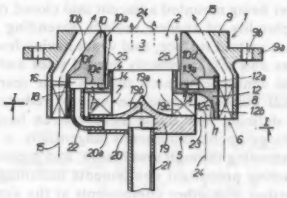
Jacques Emile Jules Caruel, Dammarie-les-Lys; Jean Robert Bedue, Creteil, and Bernard Andre Cantaloube, Chennevieres, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 12, 1973, Ser. No. 414,945

Claims priority, application France, Nov. 13, 1972, 72.40166; Oct. 26, 1973, 73.38253

Int. Cl.² F02G *3/00*; B05B *7/10*

U.S. Cl. 60—39.71 **14 Claims**



1. A fuel injector for atomizing and vaporizing fuel into an airflow, comprising a jacket (10) with a generally cylindrical inner surface (10*a*) having its axis generally parallel to the airflow direction, means (11) structurally associated with said jacket to form a generally cylindrical shield (14) extending coaxially with and over a substantially smaller axial extent than said cylindrical inner surface (10*a*), said axially smaller cylindrical shield (14) being spaced internally of an upstream section only of said cylindrical inner surface (10*a*) and ending short of a downstream section of said cylindrical inner surface (10*a*) thus leaving said downstream section unshielded, whereby said shield (14) defines with said cylindrical surface (10*a*) both a stepped tubular duct (3) and an annular duct (4) bounded by said shield (14) and said upstream section of said inner surface (10*a*), plugging means (5) fitted at the upstream end of said tubular duct (3) to bottom the same, a centripetal air swirler (7) leading into said tubular duct (3) and fitted upstream of said shield (14), means (23) tapping air from said airflow to feed said centripetal air swirler (7) thereby producing an inner whirl of air (24) through said tubular duct (3) towards the downstream end of said jacket (10), means (6) for producing an outer whirl of air (15) around said jacket (10) towards the downstream end of said jacket (10), and piping means (21, 20*a*, 22, 16, 17) for supplying fuel to said annular duct (4).

3,937,012

ARRANGEMENT FOR THE PRODUCTION OF ROTATIONAL ENERGY IN ROCKET COMBUSTION ENGINES

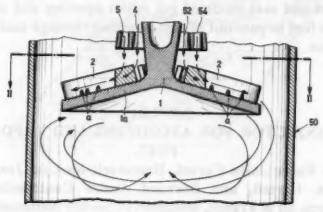
Willi Zeh, Neuenstadt, Kocher; Werner Beck, Weinsberg, and German Munding, Bad Friedrichshall, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Germany

Continuation of Ser. No. 203,115, Nov. 26, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,127

Claims priority, application Germany, Nov. 28, 1970, 2058583

Int. Cl.² F02G *1/00*

U.S. Cl. 60—39.74 A **6 Claims**



1. An arrangement for the production of rotational energy for rocket combustion chambers which are activated only by hypergolically reacting propellant components, comprising wall means defining a rocket combustion chamber having a closed rear end and a gas discharge front end, an impeller comprising a mushroom shaped body of revolution having an outwardly and forwardly facing surface facing the rear end, said impeller being mounted adjacent said closed rear end and having a plurality of spaced radially extending upstanding curved vanes on said surface, said vanes having front inwardly curved sides and rear outwardly curved sides and the curvature of said vanes being such that on their rear sides flow between said blades produces an area of reduced pressure, said vanes defining flow ducts therebetween having radially outer discharge openings directed tangentially, a plurality of passages extending through said blades, and means for directing the reacting propellant components including an oxygen carrier together with other components at the same time but in separate streams and concentrically of said impeller and into the radial inner ends of said flow ducts for interaction with each other in said ducts and for flow along said ducts to the outer circumference of said impeller and substantially tangentially into the combustion chamber with the oxygen carrier being directed radially inwardly of said impeller from the other of said components.

3,937,013

BY-PASS JET ENGINE WITH CENTRIFUGAL FLOW COMPRESSOR

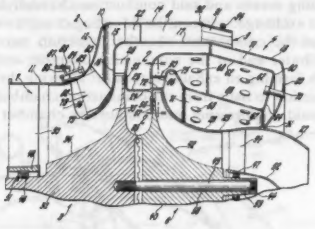
Robert H. Aspinwall, Zionsville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed June 27, 1974, Ser. No. 483,878

Int. Cl.² F02K *3/06*

U.S. Cl. 60—226 R **5 Claims**

1. A by-pass type single-shaft gas turbine jet propulsion engine comprising, in combination, an engine casing; a centrifugal compressor rotor and a centripetal turbine rotor rigidly connected coaxially back-to-back; bearing means for the rotor supported by the engine casing at the front end of the rotor and at the rear end of the rotor; combustion apparatus including combustion liner means disposed radially outward of the turbine; a diffuser connecting the compressor rotor to the combustion apparatus; and a turbine nozzle providing an outlet from the combustion liner means into the turbine rotor; the engine including an annular cascade of fan blades extending radially from the upstream end of the compressor rotor and an annular fan duct terminating in a jet nozzle disposed around the combustion apparatus, the fan blades discharging



only through the fan duct; and means operable to throttle only the fan duct for starting the engine.

3,937,014

ELECTRIC CONTROL CIRCUIT ARRANGEMENTS FOR GAS TURBINE ENGINES

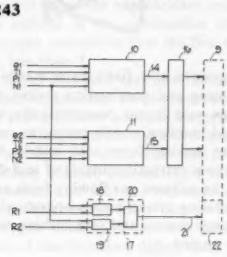
Anthony Brian Plant, Birmingham, England, assignor to Joseph Lucas Industries Limited, Birmingham, England

Filed Oct. 30, 1974, Ser. No. 519,272

Claims priority, application United Kingdom, Nov. 7, 1973, 51604/73

Int. Cl.² F02K *3/08*

U.S. Cl. 60—243 **6 Claims**



1. An electric control circuit arrangement for a gas turbine engine, comprising a first control circuit responsive to a plurality of first input signals to provide first output control signals, a second control circuit responsive to a plurality of second input signals to provide second output control signals which are nominally identical with said first output control signals, corresponding ones of said first and second input signals being nominally indentical, a third control circuit responsive to at least one of said input signals to provide a third output control signal, and selector means for rendering either said first or said second control circuit operative, said selector means being responsive to malfunction of either one of said first and second control circuits to render the malfunctioning one of said circuits inoperative and to render the other of said circuits operative.

3,937,015

PLEATED FILTER IN THE EXHAUST MANIFOLD

Hajime Akado, Kariya; Yutaka Kawashima, Okazaki; Akihide Yamaguchi, and Hideki Matsuura, both of Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Apr. 30, 1974, Ser. No. 465,625

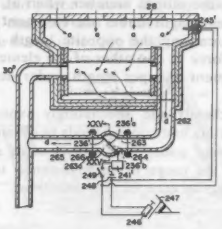
Claims priority, application Japan, May 3, 1973, 48-50130; June 1, 1973, 48-62402; June 8, 1973, 48-65231

Int. Cl.² F01N *3/00*; F02M *25/06*; F01N *3/02*

U.S. Cl. 60—288 **5 Claims**

1. An exhaust gas cleaning device for an internal combustion engine, comprising a casing adapted to be directly at-

tached to the engine and having inlet ports corresponding in number to the number of cylinders of the engine from which exhaust gas is coupled to said device, said device including at least two outlets, said inlet ports each being adapted to be directly connected to a corresponding exhaust port of said cylinder; a tubular filtering element disposed in said casing to divide the space within said casing into two spaces, said filtering element being pleated circumferentially, one of said two spaces being communicated with one of said two outlets and with said inlet ports, the other of said two spaces being communicated with the other of said two outlets and being communicated through said filtering element with said one of the two spaces; and means connected to said one of the two outlets for controlling the amount of gas passing through said one of the two outlets.



3,937,016

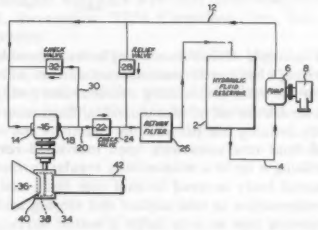
HYDRAULIC SAFETY CIRCUIT

Gerald N. Stan, 1157 Shamir Crescent, Mississauga; Leslie Toth, 41 Longhope Place, Willowdale, and John E. Rollinson, 7 Durban Road, Toronto 18, all of Ontario, Canada

Filed Oct. 8, 1974, Ser. No. 513,010

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—325 5 Claims



1. A hydraulic safety circuit for a hydraulic motor adapted to be driven from a source of pressurized hydraulic fluid, said circuit comprising:

a inlet means associated with said motor for admitting said fluid to said motor to drive said motor, said fluid entering said motor being at a first pressure,

b outlet means associated with said motor for removing said fluid from said motor, said fluid leaving said motor at said outlet means being at a second pressure, said first pressure being higher than said second pressure when said fluid is driving said motor, said second pressure being higher than said first pressure when said source is shut off and said motor is coasting,

c first conduit means for conducting spent fluid from said outlet means,

d second conduit means connecting said inlet means and said outlet means,

e and check valve means associated with said first and second conduit means and responsive to said first and second pressures for directing fluid from said outlet means through said first conduit means when said fluid is driving said motor and said first pressure is higher than said second pressure and for directing fluid from said motor through said second conduit means and hence back to said inlet means of said motor when said second pressure is higher than said first pressure, whereby when said source is shut off to shut said motor off, and when said motor is coasting so that said second pressure is higher than said first pressure, said fluid may circulate through said motor, through said outlet means, through said check valve means, through said second conduit means back to said inlet means, and again through said motor, whereby to supply said motor with fluid during coasting and hence to reduce the likelihood of motor burnout during coasting.

3,937,017

EXTERNAL COMBUSTION HOT GAS ENGINE SYSTEM

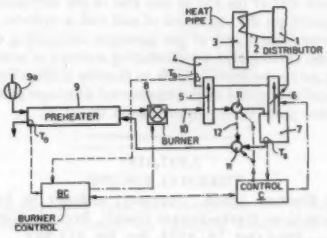
Franz Beschorner, Neusass; Burkart Feurer, and Hans Aupor, both of Augsburg, all of Germany, assignors to Maschinenfabrik Augsburg-Nuraberg Aktiengesellschaft, Augsburg and Firma Motoren-Werke Mannheim Aktiengesellschaft, Vormals Benz Abtielung Stationarer Motorenbau, Mannheim, both of, Germany

Filed Aug. 5, 1974, Ser. No. 495,009

Claims priority, application Germany, Aug. 9, 1973, 2340269

Int. Cl.[2] F01B *29/08*

U.S. Cl. 60—516 24 Claims



1. External combustion hot gas engine system having a hot gas engine (1), an engine heat exchanger (2), burner means (8, 13, 22, 26) providing hot combustion gases, and heat supply and distribution means (3, 4, 5, 6), including heat storage means (7) deriving heat from said hot combustion gases and supplying heat to the engine heat exchanger (2),

the improvement wherein

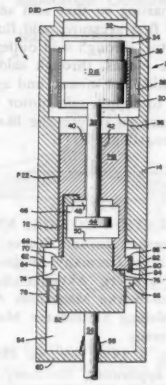
the heat storage device (7) is connected to receive hot combustion gases from the burner (8) and includes a heat storage substance, a heat pipe (6) extending into the heat storage device in a predetermined direction and in heat exchange relation with the substance, and duct means (32, 43) separate from said heat pipe (6), connected to receive the hot combustion gases from the burner, located in heat exchange relation to the heat storage substance and extending parallel to the heat pipe (6) to permit sequential or simultaneous withdrawal of heat energy by the heat pipe (6) and recharging of the storage device by energy from the burner.

3,937,018

POWER PISTON ACTUATED DISPLACER PISTON DRIVING MEANS FOR FREE-PISTON STIRLING CYCLE TYPE ENGINE

William Taylor Beale, Athens, Ohio, assignor to Research Corporation, New York, N.Y.

Filed June 7, 1974, Ser. No. 477,359
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—520 6 Claims



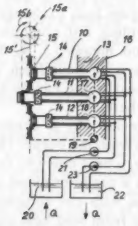
1. A free-piston Stirling cycle type engine including a displacer piston and a power piston, each mounted for reciprocation in respective displacer piston and power piston cylinder zones, means for adding heat to and withdrawing heat from opposite ends of the displacer cylinder zone and phasing means for the displacer piston comprising a rod, means connecting one end of the rod to one end of the displacer piston, a small piston on the other end of said rod, a cylinder for said small piston, and a pair of gas passages connecting opposite sides of the small piston to alternating sources of compressed gas initiated by the power piston to thereby initiate movement of the small piston and its rod connected displacer piston at an appropriate point in the power piston travel.

3,937,019

THERMAL ENGINE

Eckhard Renner, Achim, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Oct. 25, 1974, Ser. No. 517,883
Claims priority, application Germany, Nov. 2, 1973, 2354722
Int. Cl.[2] F03G 7/06
U.S. Cl. 60—527 15 Claims



1. Thermo-engine in which thermal energy is converted into mechanical, rotational energy by an output member, comprising:

a plurality of elongated elements which change their length extension under development of a relative high force, when changing temperature beyond a transition temperature or temperature range while permitting length changes in the opposite direction under exertion of relatively little force, when at a temperature oppositely beyond said transition temperature or temperature range;

means including resilient means for coupling said elements to said output member, so that the length changes of the elements are translated into rotational movement imparted upon the output member when at least one element changes length under development of said high force, while causing the opposite length change under exertion of force in one other of the elements as at least the one element changes length under development of force; and

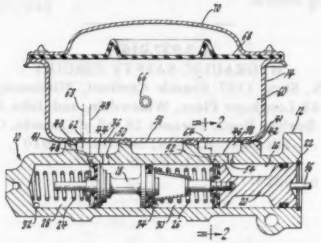
means for cyclically and alternatingly exposing said elements to heating and cooling fluids to obtain temperature changes thereof under rapid traversal of said transition temperature or range in each instance to obtain said length changes in each of said directions.

3,937,020

MASTER CYLINDER

Carl A. Bierlein, Kettering, and Ernest D. Schaefer, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 379,349, July 16, 1973, abandoned. This application Oct. 23, 1973, Ser. No. 408,461
Int. Cl.[2] B60T 17/22
U.S. Cl. 60—534 7 Claims



1. A multiple circuit master cylinder assembly having a pressurizing chamber for each circuit and an individual fluid reservoir for each pressurizing chamber and a single primary fluid reservoir for all of said individual fluid reservoirs,

a body defining said pressurizing chambers and said individual fluid reservoirs with open individual reservoir tops defining a lip in a substantially regular surface,

a second body secured to said one body and of mating conformation at said surface and closing said individual reservoir tops so as to define a bottom surface that bears against the entirety of the lip, the second body further having fluid transfer ports of small cross section in relation to the reservoirs therethrough providing continuous fluid communication between said primary reservoir and said individual reservoirs,

and a fluid level sensor sensing at least a decrease in fluid level below a predetermined level in said primary fluid reservoir.

3,937,021

HOLD OFF VALVE FOR A TWO STAGE SERVOMOTOR

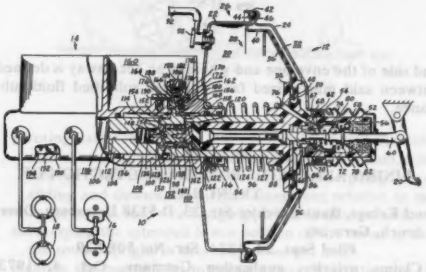
William C. Sisco, and Frederick G. Grabb, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed July 1, 1974, Ser. No. 484,381
Int. Cl.[2] B60T 11/08 ; F15B 7/04
U.S. Cl. 60—575 9 Claims

1. In a power braking system having piston means for sequentially producing a first fluid force in a first mode of opera-

tion and a second fluid force in a second mode of operation upon actuation of valve means responding to an input force, control means for permitting a volume of fluid to be transmitted to an outlet chamber to establish said first mode of operation when the valve means is actuated by an input force to optimize the development of the second fluid force, said control means comprising:

a housing having a bore therein for retaining said piston means, said piston means dividing said bore into a pressurizing chamber and a relief chamber, said pressurizing chamber communicating fluid to the relief chamber upon



actuation of the valve means, said relief chamber being connected to a reservoir through a flow path, said pressurizing chamber being connected to said reservoir through a first port in the housing to allow compensatory fluid to freely flow from the reservoir to said pressurizing chamber; and

hold off means for delaying the communication of fluid in the relief chamber to the reservoir upon actuation of the valve means to allow said piston means to move in the pressurizing chamber past said first port in the housing and supply a volume of fluid to the outlet chamber to assure that said first operational fluid force is developed.

3,937,022

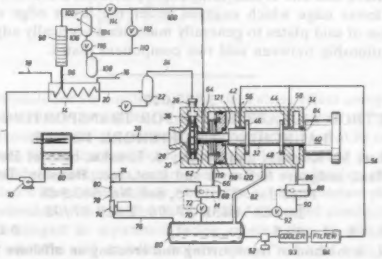
SEALED ROTARY SYSTEM AND METHOD

Judson S. Swearingen, 2235 Carmelina Ave., Los Angeles, Calif. 90064

Continuation-in-part of Ser. No. 356,580, May 2, 1973, Pat. No. 3,831,381. This application May 17, 1974, Ser. No. 470,998. The portion of the term of this patent subsequent to Aug. 27, 1991, has been disclaimed.

Int. Cl.² F01M 9/00

U.S. Cl. 60—657 24 Claims



1. In a system of the type wherein a working fluid is passed through a rotary machine, wherein said machine comprises a rotor housing, a rotor within said rotor housing integrally connected to and, in operation, rotating with a shaft on a common axis of rotation, wherein said shaft extends from said rotor housing and is supported by a first bearing assembly externally of the rotor housing, and wherein a lubricant is injected under pressure into said first bearing assembly and caused to flow through the first bearing assembly around said shaft and therefrom axially toward said rotor: the improvement which comprises seal means in said rotor housing surrounding a portion of said shaft adjacent said rotor for sealing said rotor housing around said shaft, means for separating seal fluid from said working fluid, means for injecting said separated seal fluid into said seal means around said shaft intermediate the axial extremities of the seal means, said seal fluid being non-reactive with said working fluid and said lubricant, the interior of said rotor housing defining a process zone on one side of said seal means containing said working fluid under a working pressure lower than said seal fluid as injected, a shaft housing enclosing said shaft adjacent said seal means and defining a lubricant zone on the other side of said seal means, said lubricant zone including a contact area between said seal means and said first bearing assembly and maintained under pressure lower than the pressure of said seal fluid as injected, whereby said seal fluid will leak into both said process zone and said contact area and will prevent intermingling of said working fluid and said lubricant.

3,937,023

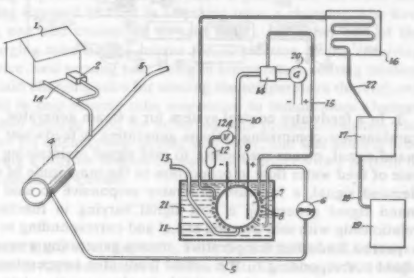
WASTE AND ORGANIC GARBAGE DISPOSAL SYSTEM WITHOUT OUT-FALL LINE OR SMOKE STACK

James T. Williamson, 217 N.W. 20th St., Fort Lauderdale, Fla. 33311

Filed Apr. 11, 1974, Ser. No. 460,091

Int. Cl.² F01K 27/00

U.S. Cl. 60—670 1 Claim



1. An improved waste disposal system comprising:

an emulsifier means for changing waste such as organic trash, garbage and sewage into a slurry mixture;

a feeder pump means;

a collection tank means connected to said emulsifier means for receiving the output slurry of said emulsifier means;

a reaction chamber means for receiving said slurry mixture connected to said collection tank means by said feeder pump means;

means for heating and pressurizing the reaction chamber means to a high temperature and high pressure connected to said reaction chamber means;

steam discharge line connected to said reaction chamber means;

residue disposal line connected to said reaction chamber means;

a turbine means connected to said steam discharge line;

an electrical generating means connected to said turbine means;

a condensate exhaust line connected from said turbine;

a reservoir connected to said turbine by said condensate discharge line;

said heating means including an electrical current heating means connected to said generator and said reactor chamber means, the residual output of said generator disposed to an outside load;

an outer chamber;

an inner chamber for receiving said slurry mixture disposed within said outer chamber;

a fluid insulating means within the outer chamber wherein the inner chamber is totally immersed within said insulating fluid means; and

preheating coil means surrounding said inner chamber also immersed in the fluid insulating means, said coil means connected to said condensate discharge line from said turbine.

3,937,024

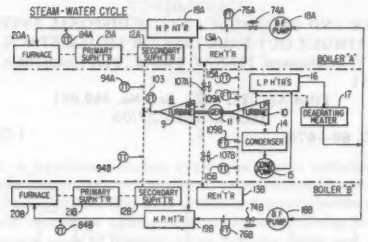
CONTROL SYSTEM FOR A TWO BOILER, SINGLE TURBINE GENERATOR POWER PRODUCING UNIT

Oliver W. Durrant, Bath Township, and John William Smith, Massillon, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Division of Ser. No. 367,775, June 7, 1973. This application Aug. 7, 1974, Ser. No. 495,314

Int. Cl.² F01K *13/00*

U.S. Cl. 60—676 **6 Claims**



1. In a feedwater control system for a steam generator, the combination comprising, means generating a feedwater demand signal, means responsive to said signal maintaining the rate of feed water flow in proportion to the magnitude of said demand signal, a function generator responsive to said demand signal generating a first signal varying in functional relationship with said demand signal and corresponding to the expected feedwater temperature, means generating a second signal corresponding to the actual feedwater temperature, a difference unit generating a third signal proportional to the difference between said first and second signals and means responsive to said third signal generating a modified feedwater demand signal to thereby adjust the feedwater flow in accordance with the difference between the expected and actual feedwater temperatures.

3,937,025

INFLATABLE ENVELOPE SYSTEMS FOR USE IN EXCAVATIONS

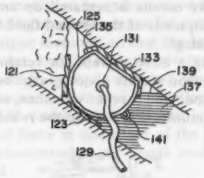
Alberto M. Alvarez-Calderon F., 512 E. Central St., Santa Maria, Calif. 93454

Filed May 2, 1973, Ser. No. 356,591

Int. Cl.² E02D *5/00*

U.S. Cl. 61—35 **25 Claims**

1. A method for extracting substances containing mineral values from a region which defines a mineralized face adjacent a chamber in an excavation site, comprising the steps of disposing an inflatable envelope within said chamber with a first side of the envelope contiguous to said face, inflating said envelope with a charge of fluid under pressure, disposing fluid substance containing a mixture of liquid and solids into the chamber contiguous to a second side of said envelope whereby said fluid substance exercises an external pressure on said envelope which is transmitted at least partially by the pressure of the fluid charge within the envelope to be resisted by said face, said fluid substance being at least partially drained to become solidified within said chamber and substantially outside said envelope whereby the boundary of said solidified fluid substance is substantially defined by said second side of the envelope and whereby an accessway is defined between said mineralized face and said solidified fluid substance.



3,937,026

LINING APPARATUS FOR THE PROTECTION OF TRENCHES

Josef Krings, Hans-Boeckler-Str. 23, D 5138 Heinsberg, Oberbruch, Germany

Filed Sept. 24, 1974, Ser. No. 508,829

Claims priority, application Germany, Oct. 4, 1973, 2349802

Int. Cl.² E21D *5/12*

U.S. Cl. 61—41 A **6 Claims**

1. Lining apparatus for the protection of trenches comprising vertical sliding carriers and lining plates which are insertable in pairs in said vertical sliding carriers on the side of a trench and capable of being pressed against walls of a trench by expanding devices, each said lining plate comprising two component plates assembled together loosely and detachably, said component plates being guided together in said sliding carriers, and one of said component plates has a bracket along its lower edge which engages under the lower edge of the other of said plates to generally maintain a vertically adjacent relationship between said two component plates.

3,937,027

METHOD AND APPARATUS FOR TRANSPORTING AND LAUNCHING AN OFFSHORE TOWER

Albert M. Koehler, and Stanley J. Hruska, both of Houston, Tex., assignors to Brown and Root, Inc., Houston, Tex.

Filed Jan. 22, 1975, Ser. No. 542,948

Int. Cl.² B63B *27/00*; E02B *17/02*

U.S. Cl. 61—46.5 **9 Claims**

1. A method of transporting and erecting an offshore tower, upright on the floor of a body of water, comprising the steps of:

supporting the tower on a barge with one lateral edge thereof being supported on pivotable skid means located along the overhanging one side of said barge and having a pivot axis extending longitudinally of said barge and tower and another lateral edge thereof being supported on fixed skid means;

floating the tower and the barge to a desired offshore location;

rotating the barge about a longitudinal axis to lower said one side thereof and, laterally incline said pivotable skid means and fixed skid means of the barge upon which the tower rests relative to the surface of the surrounding body of water transversely of the longitudinal axis;

translating the tower laterally of said barge and slidably across said laterally inclined pivotable skid means and away from said fixed skid means;

pivoting said tower about the pivot axis of said pivotable skid means to effect entry of said tower into said water free of said barge with said tower undergoing lateral sliding and downward pivotal movement relative to said barge across said overhanging pivotable skid means;

submerging the intended lower portion of the tower to turn the tower upright in the body of water; and

locating the base of the tower at a desired location on the floor of the body of water.

3,937,028

MODULE FOR CONDITIONING AIR BY THE PELTIER EFFECT AND AIR CONDITIONING INSTALLATIONS COMPRISING SUCH MODULES

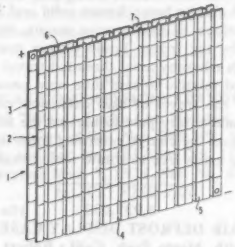
Michel Alais, Orsay, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Sept. 18, 1974, Ser. No. 507,206

Claims priority, application France, Sept. 18, 1973, 73.33429

Int. Cl.² F25B *21/02*

U.S. Cl. 62—3 **21 Claims**



1. Module for air conditioning by the Peltier effect comprising a conductor constituted by an alternate sequence of P and N thermoelements connected in series and provided at its ends with two direct current feed terminals characterized in that said module comprises, moreover, a hot conductive plate provided with parallel hollow ribs, and a cold conductive plate also provided with parallel hollow ribs, said cold conductive plate arranged in separated facing relationship to said hot plate, wherein said parallel hollow ribs of each of said two plates project between the space comprised between the planes of the two plates, each of the thermoelements being in direct contact with the crest of one rib of said hot plate and with the crest of one rib of the cold plate, the hot plate and the cold plate being divided into strip plates, each of the strip plates establishing an electrical contact between a thermoelement of the P type and a neighbouring thermoelement of the N type so as to form said continuous conductor.

3,937,029

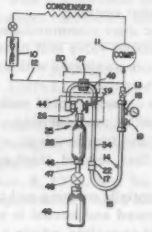
METHOD AND APPARATUS FOR CHARGING AIR CONDITIONERS WITH REFRIGERANT FLUID

Darwin R. Grahl, and Gary L. Garcia, both of Newark, N.Y., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Aug. 28, 1974, Ser. No. 501,222

Int. Cl.² F25B *45/00*

U.S. Cl. 62—77 **14 Claims**



1. A charging device for filling a receiving device with refrigerant fluid, said charging device comprising an expansion valve having an inlet to which a supply of refrigerant fluid may be connected, an outlet, a valve element for controlling flow of refrigerant fluid from said inlet to said outlet, and a pressure sensitive element controlling opening and closing of said valve element, one side of said pressure sensitive element being exposed to pressure of fluid in said outlet, the other side being exposed to fluid in a sensing tube, a charging tube having one end connected to said outlet, the other end of the charging tube having means for connection to the receiving device, said sensing tube being in temperature sensing relation to said charging tube for sensing the temperature thereof, and fluid in said sensing tube responsive to temperature changes in said sensing tube for actuating said pressure sensitive element for opening and closing said valve, and said sensing tube having a portion thereof exposed for contact with a portion of the receiving device.

3,937,030

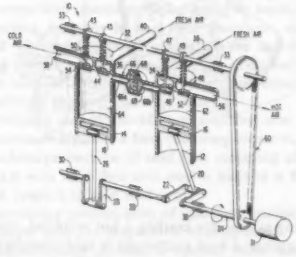
METHOD AND DEVICE FOR GAS REFRIGERATION

Hendrik Alphons Jaspers, 9 Liberty St., Ossining, N.Y. 10562

Filed June 19, 1974, Ser. No. 480,906

Int. Cl.² F25B *9/00*

U.S. Cl. 62—86 **10 Claims**



1. An open cycle system for taking ambient air and removing heat from one portion thereof and adding said heat to the remaining portion thereof to thus obtain an output of relatively cool air and an output of relatively hot air comprising:

a first cylinder,

a first piston, reciprocally received in said first cylinder and forming a first variable volume chamber therewith,

a second cylinder,

a second piston reciprocally received in said second cylinder and forming a second variable chamber therewith,

a first duct communicating said first and second chambers,

a heat capacitor means disposed intermediate the length of said duct,

power means to reciprocate said pistons in an out-of-phase relationship with respect to one another,

a first air intake duct communicated with said first chamber via a first valve seat opening,

a second air intake duct communicated with said second chamber via a second valve seat opening,

a hot air exit duct communicated with said first chamber via a third valve seat opening,

a cold air exit duct communicated with said second chamber via a fourth valve seat opening,

first, second, third and fourth valves, respectively, opening and closing said first, second, third and fourth valve seat opening,

timing means sequentially opening and closing said valves to cause air compressed and heated in said first chamber to pass through said capacitor, where a portion of the heat is stored, and then into an expanding second chamber and to exhaust this relatively cooler air to said cold air exit duct, and

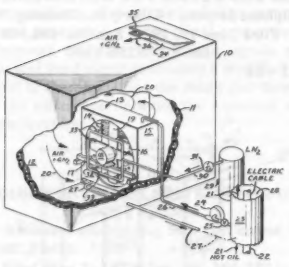
said timing means sequentially opening and closing said valves to cause fresh air to mix with said relatively cooler and expanded air in said second chamber and to pass through said capacitor in the direction toward said first chamber and removing the compression heat stored therein and then into said first chamber and to exhaust whereby the relatively hot air is exited through said hot air exit duct.

3,937,031

COOLING SYSTEM AND METHOD OF COOLING

Neal A. Cook, Racine, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Oct. 25, 1974, Ser. No. 517,936
Int. Cl.² F25D 17/02
U.S. Cl. 62—98 12 Claims



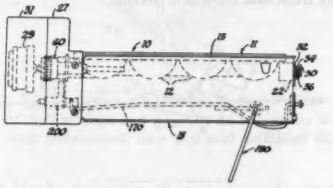
1. A cooling system for cooling a hot material, comprising: a cooling chamber; a heat exchanger in said chamber occupying only a fraction of a cross sectional space in said chamber; gas circulating means for forcing a cooling gas within said chamber in a closed circuit within said space in said chamber that includes cooling contact with said heat exchanger; a source of hot material externally of said chamber; means for passing said hot material from said source through said heat exchanger and back to said source; and means for selectively providing an additional cryogenic gaseous cooling medium to the cooling gas in said closed cooling gas circuit.

3,937,032

TRAY ICE MAKER TEMPERATURE CONTROL ICE CLUTCH

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 29, 1974, Ser. No. 527,957
Int. Cl.² F25C 1/10; F16D 11/00
U.S. Cl. 62—135 8 Claims



1. An automatic ice maker for a refrigerator including a support for an ice piece mold mounted for rotational movement on said support, means for supplying water to said mold, means for freezing water in said mold, drive means including a drive shaft having an axially movable extension thereon, a portion of said extension having an external helical thread, means for harvesting ice from said mold, a separate rotary part on said support adapted to be driven by said drive means to initiate the ice harvesting operation, connecting means controlled by a temperature responsive ice clutch adapted to connect said rotary part to said extension when the water in said mold is frozen, said ice clutch including a sensing tube fixedly positioned to said mold, said tube having a cavity of a predetermined size whereby said threaded extension being rotatable and axially movable therein, the inner surface of said cavity having groove means, means for connecting said drive means to a source of power whereby said extension is constantly rotated in said cavity, the space between adjacent turns of said thread and said cavity inner surface being filled with a liquid charge, means for sealing the liquid charge within said cavity, upon completion of the freezing of the water in said mold the liquid charge being frozen solid and locked to said cavity inner surface by said groove means, internal threads being formed by the frozen liquid charge mating with said external threads whereby axial threaded travel of said extension is produced relative to said tube, said connecting means operable upon the travel of said extension connecting said drive shaft to said rotary part to harvest ice from said mold, and whereby upon the charge returning to its liquid state said extension being again free to rotate within said cavity.

3,937,033

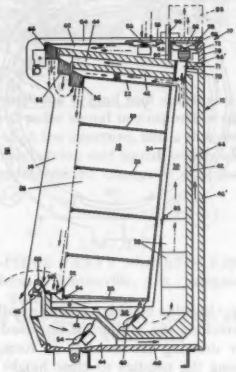
AIR DEFROST DISPLAY CASE

Sterling Beckwith, Menlo Park, Calif.; Robert E. Vogel, and William Goyman, both of Marshall, Mich., assignors to Kysor Industrial Corporation, Cadillac, Mich.

Filed Feb. 7, 1975, Ser. No. 547,817
Int. Cl.² F25D 21/06
U.S. Cl. 62—155 4 Claims

1. In an upright refrigerated display cabinet having a top, a bottom, a rear, a front side, and an access opening in said front side communicating a storage and display space within the cabinet with the ambient atmosphere, at least two outlets, an inner one and an adjacent one, extending across one edge of said access opening; and corresponding inner and adjacent inlets extending across the opposite edge of said access opening; an inner conduit extending from said inner inlet, around the bottom, back and top of said cabinet, to said inner outlet; an adjacent conduit extending from said adjacent inlet around said cabinet to said adjacent outlet; refrigeration coil means in said inner conduit; a plurality of refrigerated air circulating fans in said inner conduit to propel air from said inner inlet, across said coil means, to said inner outlet, and across said

access opening; a plurality of guard air circulating fans in said adjacent conduit; the improvement comprising: exhaust plenum means at the upper rear of said cabinet; exhaust passages extending from said refrigerated air duct, downstream of said coil means, to said exhaust plenum means; ports extending from said exhaust plenum means through said cabinet top; exhaust fan means in said exhaust plenum means oriented to withdraw air from said refrigerated air duct and discharge it out said ports; doors over said ports shiftable between a port-closing position and a port-opening position; power means for



shifting said doors to said port opening position; control means operably associated with said guard curtain fans, said exhaust fan means and said power door shifting means, said control means being operable between one condition, for refrigeration, at which said guard curtain fans are actuated, said exhaust fan means is deactuated, and said power door shifting means is not actuated; and a second condition, for defrost, at which said guard curtain fans are deactuated, said exhaust fan means are actuated, and said power door shifting means is actuated to open said ports.

3,937,034

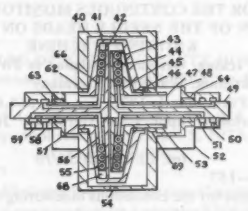
GAS COMPRESSOR-EXPANDER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. Nos. 399,199, Sept. 20, 1973, abandoned, and Ser. No. 405,584, Oct. 11, 1973. This application Mar. 7, 1974, Ser. No. 448,818

Int. Cl.[2] F25B *3/00*

U.S. Cl. 62—401 **1 Claim**



1. In a compressor-expander having two rotating rotors with a fluid to be compressed being the first fluid, with a first rotor having an entry for said first fluid near the center of rotation with said first fluid then being accelerated and compressed in outward extending first rotor passages and said first fluid then being passed into a second rotor for deceleration and expansion, and to exit near the center of rotation of said second rotor, with heat being removed from said first fluid in a heat removal heat exchanger within said first rotor outward passages by circulating a second fluid in heat exchange relationship with said first fluid, the improvement comprising:

a. a heat addition heat exchanger within said inward extending second rotor first fluid passages for adding heat to said first fluid during said expansion and deceleration, by circulating a third fluid in heat exchange relationship with said first fluid,[4] with a third fluid being supplied and discharged via passages carried by said second rotor.

3,937,035

UNIVERSAL JOINT

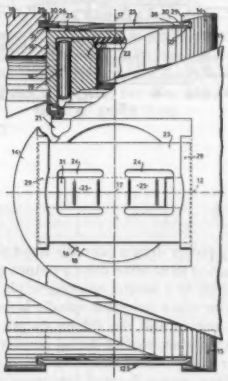
Leslie George Fisher, Birmingham, and Bertram Joseph Palmer, Barton-under-Needwood, Near Burton-on-Trent, both of England, assignors to GKN Transmissions Limited, Birmingham, England

Filed Nov. 8, 1974, Ser. No. 522,151

Claims priority, application United Kingdom, Nov. 9, 1973, 52110/73

Int. Cl.[2] F16D *3/26*

U.S. Cl. 64—17 A **7 Claims**



1. In a Hooke's joint comprising two yoke elements, each having first and second arms, four bearing cups disposed within respective openings formed one in each of said arms, a connecting member having four trunnions, each trunnion received within a respective one of the bearing cups and retaining means provided on the yoke arms for retaining respective ones of the bearing cups within respective ones of said openings, the improvement wherein:

the retaining means provided on said first arm of each yoke element comprises a first retaining element,

an anchorage portion of said first retaining element is engaged with said first arm and is held in a fixed position with respect to said first arm,

a constraining portion only of said first retaining element is engaged with the respective bearing cup,

said constraining portion is spaced from said anchorage portion and is resiliently-displaceable relative thereto,

the retaining means provided on said second arm of each yoke element comprises a second retaining element,

an anchorage portion of said second retaining element is engaged with said second arm and is held in a fixed position with respect to said second arm,

a respective one of said bearing cups is engaged with a constraining portion of said second retaining element, and

said constraining portion of the second retaining element adjoins the anchorage portion thereof and is substantially immovable relative to said anchorage portion,

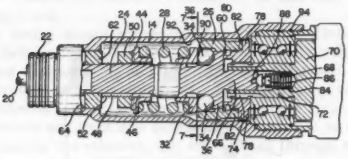
whereby said first retaining element is adapted to bias the associated bearing cup in a direction inwardly of the cup and said second retaining element is adapted to function as a rigid stop positively to limit movement of the associated bearing cup in a direction outwardly of the joint but not to bias the bearing cup inwardly of the joint.

3,937,036

ROTARY DRIVING TOOL HAVING A TORQUE RESPONSIVE CLUTCH

William Douglas Sauerwein, Joppa, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed May 8, 1974, Ser. No. 468,027
Int. Cl.² F16D 3/56
U.S. Cl. 64—29 13 Claims



1. In a rotary power driven portable hand tool having drive means and adapted to receive driven output means, the combination therewith of a torque responsive clutch comprising:

a clutch carrier and a rotatable spindle interconnected with said drive means and the driven output means, respectively, said clutch carrier being journalled about said spindle for independent rotational movement;

first radial face means formed integrally on said spindle, second radial face means confronting said first radial face means, one of said face means being provided with a cam surface having spaced apart recess means, and at least said one face means being rotatable with said spindle;

a plurality of clutch elements rotatable with said clutch carrier, said clutch elements being disposed between said confronting face means;

compression spring means disposed about said spindle, one end of the compression spring means being operable to bias one of said face means axially toward the other face means whereby said clutch elements are normally forced into said spaced apart recess means; and

spring retaining means mounted upon said spindle and operative to engage the other end of a compression spring means to hold said compression spring means in compression;

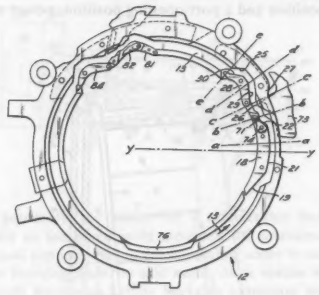
the parts being so arranged and constructed that when overload torque conditions are encountered by the driven output means the clutch elements will move out of said spaced apart recess means to temporarily interrupt the drive between said first and second members, said clutch elements automatically moving back into said spaced apart recess means to reengage the drive between said first and second members when said overload torque conditions are removed, and the forces exerted by said spring at all times being transmitted to the spindle by the spring retaining means and said first face means being independent of thrust bearing means.

3,937,037

METHOD AND APPARATUS FOR KNITTING TERRY FABRIC

Robert J. Moody, Franklin, N.H., assignor to Scott & Williams, Inc., N.H.

Filed Jan. 9, 1974, Ser. No. 431,686
Int. Cl.² D04B 9/12, 15/24
U.S. Cl. 66—93 8 Claims



1. In a circular knitting machine having needles and sinkers, means for controlling the motion of the needles including a stitch cam for drawing the needles to form stitches, cam means for raising the needles to clear height subsequent to being drawn by said stitch cam, said sinkers having first and second yarn drawing ledges adapted to form regular and elongated loops respectively, a yarn feeding station having first and second yarn feeding means for feeding separate yarns to said first and second sinker ledges respectively, first sinker cam means for withdrawing said sinkers in preparation for feeding yarn at said feed station, first sinker cam means for advancing the sinkers in a zone between the feed station and stitch drawing station to a position where the yarns of the first and second feeding means are laid over the first and second sinker ledges respectively, second sinker cam means for withdrawing the sinkers substantially immediately after said yarns have been fully drawn into stitches at said stitch cam to permit said second yarn to be transferred from the second ledge to the throats of said sinkers, and second sinker cam means for advancing said sinkers before the needles are raised substantially above knockover height whereby the loops formed by said second yarn are restrained in said throats when said needles are raised to clear height by said cam means to assure reliable clearing of the loops of both of said yarns.

3,937,038

DEVICE FOR THE CONTINUOUS MONITORING OF THE CONDITION OF THE NEEDLE HEADS ON A CIRCULAR KNITTING MACHINE

Erwin Sick, Icking, Germany, assignor to Firma Erwin Sick Optik-Elektronik, Waldkirch, Germany

Filed June 1, 1973, Ser. No. 366,022
Claims priority, application Germany, June 15, 1972, 2229232
Int. Cl.² D04B 35/10
U.S. Cl. 66—157 11 Claims

1. Apparatus for the continuous monitoring of the condition of the needle heads of a circular knitting machine which move past a predetermined point one after the other at a definite frequency, comprising a housing having a tube, an illuminating component and a receiving component disposed side by side in said housing, said illuminating component comprising: a light source, a condensing lens, a slit and focusing lenses for producing a light spot in the form of a line situated in the plane of an illuminated needle head, without light projecting laterally beyond it, said focusing lenses being disposed in the tube

and consisting of a semicircular lens occupying substantially half the cross-section of the tube and a round aspherical lens occupying the entire cross-section of the tube disposed behind the semi-circular lens, the focal point of the semi-circular lens lying in said slit, said light spot being projected into an aperture substantially the size of the image of the light spot, a

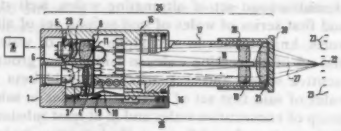


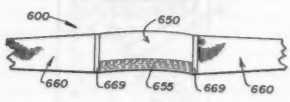
photo-receiver disposed behind said aperture and adapted to emit an electrical pulse signal in proportion to the luminous flux passing through the aperture, and a threshold value electronic device for receiving said signal, which when said signal undergoes a predetermined change is adapted to deliver a warning signal.

3,937,039

ONE-PIECE PANTY AND STOCKINGS

Ronald W. Anderson, Bentonville, Ark., assignor to Prenihan A.G., Zurich, Switzerland

Filed Oct. 22, 1968, Ser. No. 769,480
Int. Cl.² A41B *11/02*
U.S. Cl. 66—177 **7 Claims**



2. A seamless, circular knit lower body covering type garment comprising

a. a seamless curved panty portion having integrally formed downwardly depending leg portions defining a crotch area therebetween,

b. said seamless curved panty portion having an upper waist opening and an elastic band attached to the waist opening,

c. the size of the stitch loops in courses of at least said curved panty portion being reduced from large stitch loops positioned in a wale extending along opposite sides of said panty portion to small stitch loops inner sides of said leg portions and through the center of said crotch area, the curvature in the panty portion being produced solely by reducing the size of the stitches.

3,937,040

METHOD OF KNITTING PANTY HOSE

Ettore Negri, Florence, Italy, assignor to Billi S.p.A., Florence, Italy

Filed Apr. 4, 1974, Ser. No. 458,024
Claims priority, application Italy, Apr. 5, 1973, 9405/73
Int. Cl.² A41B *9/02*
U.S. Cl. 66—177 **2 Claims**

1. A method of knitting the body portion of a panty or panty hose of one piece construction on a circular knitting machine, said panty or panty hose having first and second leg portions and waist portions, said method comprising:

a. knitting a first tubular knit leg portion by circular knitting,

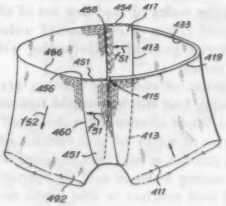
b. supporting the tubular knit portion on the knitting needles while inactivating the needles along a first arc,

c. knitting by reciprocal motion on a second arc of needles to form a first waist panel,

d. casting off the fabric from the second arc of needles,

e. activating the needles along said first arc of needles and knitting by reciprocal motion along said first arc of needles to form a crotch panel,

f. inactivating said first arc of needles while supporting the crotch panel thereon,



g. knitting a second waist panel on said second arc of needles, and

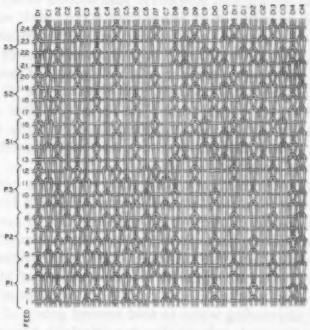
h. knitting on all the needles in a circular motion to form the second tubular knit leg portion.

3,937,041

HIGH RELIEF DOUBLE KNIT FABRIC

Bobby L. Balcombe, Greenville, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 21, 1974, Ser. No. 516,476
Int. Cl.² D04B *9/06*
U.S. Cl. 66—197 **10 Claims**



1. A double knit fabric comprising a first set of alternating wales forming the face of said fabric, and a second set of alternating wales forming the reverse side of said fabric, each interior wale of said first set of alternating wales being positioned between two wales of said second set of alternating wales;

said fabric having a repeat pattern of at least one primary set of consecutive courses followed by at least one secondary set of consecutive courses and a first group of consecutive wales followed by a second group of consecutive wales, each said first group of consecutive wales containing at least four wales in said first set of alternating wales and at least four wales in said second set of alternating wales, each said second group of consecutive wales containing at least four wales in said first set of alternating wales and at least four wales in said second set of alternating wales;

each said primary set of consecutive courses comprising, consecutively, first, second, third and fourth courses;

the first course of each said primary set of consecutive courses having knit stitches in a first series of wales of said

second set of alternating wales, welt stitches in a second series of wales of said second set of alternating wales, said wales of said second series generally alternating with said wales of said first series, knit stitches in an alpha series of wales of said first set of alternating wales in said first group of consecutive wales, and welt stitches in a beta series of wales of said first set of alternating wales in said first group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said second group of consecutive wales, said wales of said beta series generally alternating with the wales of said alpha series;

the second course of each said primary set of consecutive courses having knit stitches in said first series of wales of said second set of alternating wales, welt stitches in said second series of wales of said second set of alternating wales, knit stitches in said beta series of wales of said first set of alternating wales in said first group of consecutive wales, and welt stitches in said alpha series of wales of said first set of alternating wales in said first group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said second group of consecutive wales;

the third course of each said primary set of consecutive courses having knit stitches in said second series of wales of said second set of alternating wales, welt stitches in said first series of wales of said second set of alternating wales, knit stitches in said alpha series of wales of said first set of alternating wales in said first group of consecutive wales and welt stitches in said beta series of wales of said first set of alternating wales in said first group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said second group of consecutive wales;

the fourth course of each said primary set of consecutive courses having knit stitches in said second series of wales of said second set of alternating wales, welt stitches in said first series of wales of said second set of alternating wales, knit stitches in said beta series of wales of said first set of alternating wales in said first group of consecutive wales, and welt stitches in said alpha series of wales of said first set of alternating wales in said first group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said second group of consecutive wales;

each said secondary set of consecutive courses comprising, consecutively, first, second, third and fourth courses;

the first course of each said secondary set of consecutive courses having knit stitches in said first series of wales of said second set of alternating wales, welt stitches in said second series of wales of said second set of alternating wales, knit stitches in said beta series of wales of said first set of alternating wales in said second group of consecutive wales, and welt stitches in said alpha series of wales of said first set of alternating wales in said second group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said first group of consecutive wales;

the second course of each said secondary set of consecutive courses having knit stitches in said first series of wales of said second set of alternating wales, welt stitches in said second series of wales of said second set of alternating wales, knit stitches in said alpha series of wales of said first set of alternating wales in said second group of consecutive wales, and welt stitches in said beta series of wales of said first set of alternating wales in said second group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said first group of consecutive wales;

the third course of each said secondary set of consecutive courses having knit stitches in said second series of wales of said second set of alternating wales, welt stitches in said first series of wales of said second set of alternating wales, knit stitches in said beta series of wales of said first set of alternating wales in said second group of consecutive wales, and welt stitches in said alpha series of wales of said first set of alternating wales in said second group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said first group of consecutive wales; and

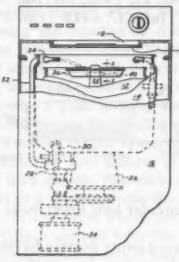
the fourth course of each said secondary set of consecutive courses having knit stitches in said second series of wales of said second set of alternating wales, welt stitches in said first series of wales of said second set of alternating wales, knit stitches in said alpha series of wales of said first set of alternating wales in said second group of consecutive wales, and welt stitches in said beta series of wales of said first set of alternating wales in said second group of consecutive wales and in at least substantially all of the wales of said first set of alternating wales in said first group of consecutive wales.

3,937,042

REUSABLE WATER SOFTENER SYSTEM FOR CLOTHES WASHER

Leopold Loeb, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Nov. 19, 1973, Ser. No. 417,364
Int. Cl.[2] D06F *39/00*
U.S. Cl. 68—13 A **4 Claims**



1. In a clothes washer having a tub, an agitator, a pump to draw liquid from the tub, and a conduit connected to the pump for selectively returning liquid to the tub, a water softening system utilizing a reusable, self-contained, water softener device comprising:

a package of cation exchange resin, the package being permeable to water and arranged to be disposed within the tub and removably placed around the agitator such that water will be circulated through the resin by means of said pump and conduit for removing calcium and magnesium ions from the water to effect a reduction of hardness of the water,

the resin being capable of regeneration by treatment with a salt solution.

3,937,043

VAPOR SAVING AMBIENT AIR INTAKE SYSTEM FOR A DRY CLEANER

John D. Hughes, Murrysville, Pa., and Al W. Klingensmith, Mansfield, Ohio, assignors to White-Westinghouse Corporation, Cleveland, Ohio

Filed Feb. 25, 1974, Ser. No. 445,501
Int. Cl.[2] D06F *43/02*, *43/08*
U.S. Cl. 68—18 R **4 Claims**

1. An automatic dry cleaning machine having:

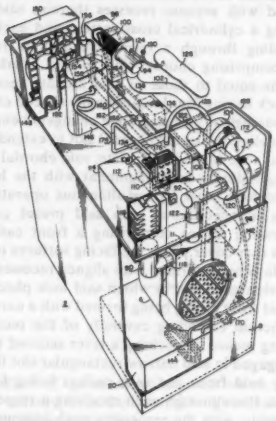
a cabinet housing a stationary outer tub and a rotatable inner tub, said housing defining an opening for access to the interior of said tubs through their common open end and door means hingedly attached to said cabinet for

movement between an open and closed position for effectively sealing said opening when in said closed position;

a solvent circulating system for delivering solvent to said tubs and draining solvent from said tubs;

an air circulating system for passing air through said tubs; and,

an intake air system for drawing ambient room air through said opening when said door means is in said open position and directing said air to an outlet, and wherein the improvement comprises:



an intake fan in said intake system;

duct means in air flow communication with said tubs at their common open ends;

valve means between said duct means and said intake fan to control a flow of air through said duct means to said fan, said valve means being normally closed and said fan being normally off; and, means responsive to movement of said door from said closed position to energize said fan and open said valve, whereby room air enters said opening and flows directly into said duct means for maintaining the inner volume of said tubs out of the normal flowpath of said room air.

3,937,044

APPARATUS FOR DYEING PILE FABRICS

Trevor Balmforth, Clitheroe, England, assignor to Stalwart Dyeing Company Limited, England

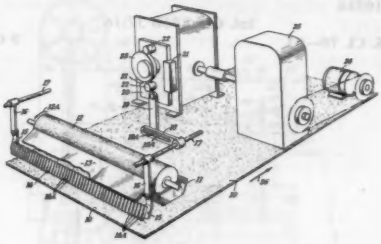
Filed July 9, 1974, Ser. No. 486,846

Claims priority, application United Kingdom, July 17, 1973, 33988/73

Int. Cl.[2] D06B 1/06

U.S. Cl. 68—205 R **3 Claims**

1. Apparatus for dyeing a length of pile fabric moving continuously with its pile surface uppermost, comprising a trough to contain dye liquor, a rotatable lick roller mounted in the trough with its axis extending transversely to the direction of travel of the fabric, a doctor blade extending parallel to the lick roller with its upper edge in contact with the lick roller, to pick up a film of dye liquor from the lick roller, the doctor blade having a smooth, uninterrupted upper surface, a corrugated sheet extending transversely to the direction of travel of the fabric and disposed beneath the lower edge of the doctor blade, the corrugated sheet collecting in its channels by gravity from the doctor blade a number of parallel streams of drops of dye liquor from which the drops fall directly on to the fabric, and means for imparting oscillation to the corrugated



sheet in a direction transverse to the direction of travel of the fabric.

3,937,045

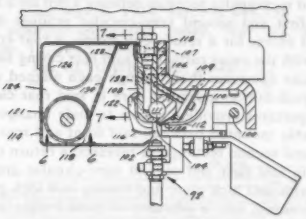
DYEING AND PRINTING OF MATERIALS

Norman E. Klein, Inman, and William H. Stewart, Jr., Spartanburg, both of S.C., assignors to Deering Milliken Research Corporation, Spartanburg, S.C.

Filed Jan. 3, 1974, Ser. No. 430,524

Int. Cl.[2] D06B 1/02

U.S. Cl. 68—205 R **6 Claims**



2. Apparatus to apply liquid dyestuff to moving material comprising a dye jet gun bar having a plurality of dye-emitting orifices, means to convey the material adjacent said orifices, means to supply liquid dyestuff to said gun bar and orifices to direct the dye in plural streams toward the moving material to be dyed, means to supply a gaseous fluid under pressure against the dye streams issuing from said orifices to divert the streams in a path of collection away from said means to convey, a dye accumulation chamber having an entrance positioned adjacent said orifices and in said collection path to collect the diverted dye, a wall adjacent said entrance and said path having a curved surface diverging from said collection path to facilitate separation of the gaseous fluid from the liquid dye due to a surface attachment effect, and a deflector plate located across the entance of said accumulation chamber from said curved wall surface and having a facing surface diverging from the curved wall surface inwardly of the entrance to create a venturi effect in the path of collection and facilitate movement of the dye into the accumulation chamber.

3,937,046

MULTI-COMBINATION PUSH BUTTON LOCK

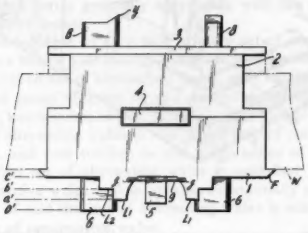
Hong Wen Wang, 2 Te Seng St., Kaohsiung, Taiwan, China /Taiwan

Filed Nov. 6, 1974, Ser. No. 521,469

Claims priority, application China /Taiwan, Mar. 25, 1974, 6310584

Int. Cl.² E05B 37/16

U.S. Cl. 70—81 9 Claims



1. A multi-combination push-button lock, with a plurality of preset positions, comprising, in combination, a front casing formed with a plurality of push-button bores therethrough each having a narrow chordal aperture adjacent the front surface of said front casing, the rear surface of said front casing being formed with a first rectangular recess having a first elongated semi-circular groove extending centrally thereof; a rear casing, fixed to said front casing, having a plurality of push-button assembly bores formed therethrough in alignment with said push-button bores of said front casing, and the surface of said rear casing facing said front casing being formed with a second rectangular recess having a second semi-circular groove extending centrally thereof, said first and second rectangular recesses defining a slot for a lock plate and said first and second semi-circular grooves defining a cylindrical recess for a return coil spring; a rear cover plate engaged with the outer surface of said rear casing and formed with circular apertures therethrough each aligned with a respective push-button assembly bore in said rear casing, said circular apertures providing access to code changers; a lock plate slidably mounted between said front and rear casing in said first and second rectangular recesses; a return coil spring disposed in said first and second semi-circular grooves and engaged with said lock plate and biasing said lock plate to its locking position; and a plurality of push-button assemblies each including a push-button, having an elongated chordal portion extending from a circular flange at its inner end, each push-button being mounted in a respective push-button bore, a cylindrical interlock block formed with four axially spaced chordal grooves in its outer periphery to provide four selective preset positions including shallow push, medium push, deep push and no push for the associated push button, each interlock block extending in a respective push-button bore and a respective push-button assembly bore aligned with the respective push-button bore, a code changer engaged with said interlock block and each disposed in a respective push-button assembly bore and having four angular setting positions corresponding to said four selective preset positions of the associated interlock block, for unlocking, and a respective coil spring engaged between each code changer and the associated interlock block and biasing the respective code changer toward the rear side and the respective interlock block and push-button conjointly toward the front side.

6. A multi-combination push-button lock comprising, in combination, lock casing means constructed for installation in a door, a drawer, and the like; a lock plate slidably mounted in said casing means for movement between a projected locking position and a retracted unlocking position; manually actuable operating means secured to said lock plate; a plurality of push-button assemblies mounted in said casing means and each including a push-button, an interlock block and a code changer; said interlock blocks being interengageable with said lock plate to prevent movement thereof by said operating means and being displaceable longitudinally, to release said lock plate, by simultaneous operation of said push-buttons in accordance with a preset combination code; said interlock blocks being angularly adjustable by said code changers to preset the combination code; said interlock blocks having equal numbers of longitudinally and angularly spaced formations each of which, when aligned with said lock plate, releases the interengagement of the associated interlock block and said lock plate; the longitudinal edges of said lock plate, considered in the direction of movement of said lock plate, being formed with arcuate recesses therein; said interlock blocks having a cylindrical cross-section and each interlock block extending through a respective arcuate recess; said formations comprising chordal slots in said interlock blocks having depths equal to those of said arcuate recesses; each interlock block having four longitudinally spaced chordal slots at angular spacings of 90°; said code changers being operable selectively to align a selected chordal slot to extend parallel to a longitudinal edge of said lock plate; said chordal slots being movable longitudinally into alignment with the longitudinal edges of said lock plate by simultaneous operation of said push-buttons in accordance with said preset combination code; said casing means comprising a front casing, a rear casing, and a rear cover plate; the facing surfaces of said front and rear casings being formed with aligned recesses conjointly defining an elongated slot in which said lock plate is slidably mounted; said front casing being formed with a narrow rectangular slot therein extending centrally of the recess therein; said operating means comprising a lever secured to said lock plate and engaged in said narrow rectangular slot through said front casing; said front and rear casings being formed with aligned bores therethrough each receiving a respective push-button assembly, with the respective push-buttons projecting forwardly of the outer surface of said front casing; said rear cover plate being formed with circular apertures therethrough each aligned with a respective push-button assembly receiving bore and providing access to said code changers; first spring means biasing said lock plate to its projected locking position; and second spring means each biasing a respective push-button to project outwardly of the front surface of said front casing, each push-button being formed with means limiting its outward projection; the outer surface of said front casing being formed with ribs projecting therefrom different distances and, together with the outer surface of said front casing, defining respective operated positions of said push-buttons.

3,937,047

STRUCTURE AND METHOD FACILITATING STRIPPING OF SEAMLESS CAN BODY FROM IRONING MANDREL

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1975, Ser. No. 559,056

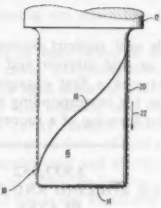
Int. Cl.² B21D 45/00

U.S. Cl. 72—344 8 Claims

1. Structure for use in an ironing process in which the sidewall sheet metal of a seamless, unitary, cup-shaped article is reduced in thickness and elongated by passage of the cup-shaped article, while mounted on a mandrel through a plurality of female, circular, ironing rings of progressively smaller internal diameter, during which passage an intimate surface contact is normally established causing an undesirably tight adherence between the elongated sidewall of the cup-shaped article and the punch,

such structure facilitating removal of an ironed sidewall cup-shaped article from the mandrel after ironing comprising

an elongated, generally-cylindrical configuration ironing mandrel having a
work input end,
a central longitudinal axis,
a sidewall radially spaced from the central
longitudinal axis, and
a work output end longitudinally opposite to the work input end,
the mandrel sidewall including indention means and remaining peripheral surface means, the latter being uniformly spaced radially from the central longitudinal axis of the mandrel,
the indention means comprising a narrow-width, linearly-extended indentation subsurface of the remaining periph-



eral surface of the mandrel sidewall which is uniformly spaced radially from the central longitudinal axis,
such indentation extending over a major portion of the mandrel sidewall which is contacted by sheet metal of the cup-shaped article sidewall providing for movement of sidewall sheet metal into such indentation to form a protrusion on the interior surface of the sidewall of the cup-shaped article during passage through an ironing ring and for movement of such protrusion metal along the sidewall of the mandrel during passage through a subsequent ironing ring so as to reduce intimate surface contact between the interior surface of the cup-shaped article and the ironing mandrel to facilitate removal of such cup-shaped article after ironing.

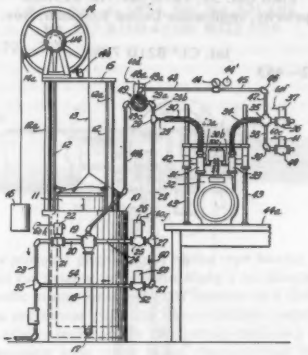
3,937,048

METHODS AND APPARATUS FOR PROVING GAS METERS

Theodore A. St. Clair, Fairfield; Richard K. Weltz, Southbury, and Henry T. Yaglowski, Bridgeport, all of Conn., assignors to Textron Inc., Providence, R.I.

Filed Dec. 5, 1974, Ser. No. 529,947
Int. Cl.[2] G01F *25/00*
U.S. Cl. 73—3 **33 Claims**

1. The herein described method of proving a positive displacement, diaphragm-operated gas meter having metering mechanism and a prover bell which comprises the steps of causing test gas to flow through said meter and in said prover bell; causing said metering mechanism to operate through a predetermined number of cycles of operation and during such operation sensing resultant internal pressure fluctuations of said test gas in the meter which fluctuations are manifested as a family of pressure waves, which reoccurs during each cycle of operations of the metering mechanism; converting said pressure waves into a train of electrical signals of varying voltages; amplifying said signals; detecting and holding peak signals occurring during each cycle of operation of said metering mechanism; counting the number of said peak signals until a predetermined number of said peak signals has been received; and simultaneously signaling an encoder on said prover bell to record the volume of test gas which has passed



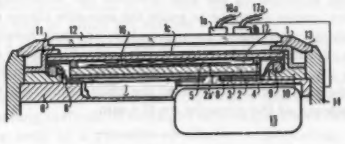
through said meter during said predetermined number of cycles of operation to determine the proof of the meter.

3,937,049

MONITORING SYSTEM FOR DIGITAL ELECTRONIC TIMEPIECE

Tomomi Murakami, Tokyo, and Hideyuki Kawashima, Higashikurume, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1974, Ser. No. 448,738
Claims priority, application Japan, Mar. 12, 1973, 48-28732; Apr. 11, 1973, 48-41117
Int. Cl.[2] G04B *17/00*; G04D *7/12*
U.S. Cl. 73—6 **8 Claims**



1. In an electronic timepiece provided with a metallic casing, display means including electrode segments arrayed in digital patterns to be displayed in a recurrent cycle, and an electronic clockwork for selectively exciting said segments to establish said patterns, the combination therewith of a transparent cover on said casing overlying said display means and enabling said patterns to be observed, a transparent shield electrode within said casing electrically connected thereto and extending over the major part of said display means while leaving free at least one window offset from said segments, at least one monitoring conductor in said casing electronically disconnected therefrom and aligned with said window, circuit means linking said monitoring conductor with said electronic clockwork for periodic pulsing thereby, at least one detecting electrode on said cover aligned with said window for picking up pulses from said monitoring conductor, and evaluation means connected to said detecting electrode for measuring the recurrence rate of said pulses.

3,937,050

APPARATUS FOR CONSTRICTING OR CLOSING CONDUITS

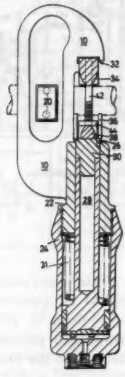
James Nicholson, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Oct. 31, 1974, Ser. No. 519,658

Claims priority, application United Kingdom, Nov. 6, 1973, 51429/73

Int. Cl.² B21D 7/00

U.S. Cl. 72—453 1 Claim



1. An apparatus for constricting or closing a conduit which comprises a framework comprising a pair of generally parallel clamp frames opening in the same direction, a fixed bridging means on one side of the clamp openings locating the clamp frames at a mutual separation such as to accommodate the conduit between them, a fluid-operated ram mounted so as to be movable from one side towards the further side of the clamp openings, the barrel of the ram being secured to the fixed bridging means, means formed in the further side of the clamp frames for detachably locating a stationary clamp member, a stationary clamp member detachably located by such locating means and bridging the clamp members at the further side, a movable clamp member detachably connected to the ram and actuable by the ram towards the stationary clamp member, means effective to guide the movable clamp member towards the stationary clamp member, and bolt means effective as additional guide means for the movable clamp member during the constricting or closing operation and tightenable after the said operation to hold the clamp members together after release of the pressure on the ram.

3,937,051

BELLOWS FORMING METHOD AND APPARATUS

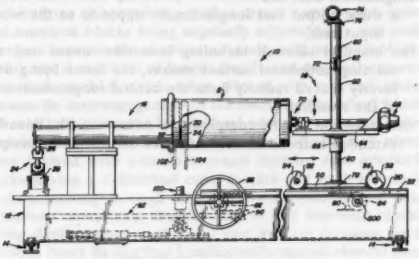
James W. Banks, Bozman, Md., assignor to Chemetron Corporation, Chicago, Ill.

Filed May 30, 1974, Ser. No. 474,726

Int. Cl.² B21D 15/06

U.S. Cl. 72—110 7 Claims

1. In a bellows forming machine of the type including a frame, a rotatable chuck adapted to hold a blank having an elongated tubular wall and a longitudinal central axis to be formed into a bellows having circumferential convolutions, support means for movably mounting said chuck on said frame, rotating means for rotating said chuck and the blank about the axis of the blank, forming means including an interior forming roll and an exterior forming roll positionable on opposite sides of the wall and relatively movable toward and away from each other and thus toward and away from the wall for forming a circumferential convolution in the wall upon relative motion of the rolls toward the wall as said chuck and the blank are rotated conjointly about the axis of the blank, biasing means for biasing said support means toward said interior forming roll and indexing means for indexing said chuck and the blank along the axis to allow successive convolutions to be formed similarly in the wall, the improvement wherein said indexing means comprises means selectively



engageable with said support means and movable by said biasing means, as said interior and exterior rolls clear the convolution, between a first engaged position to a second engaged position, for corresponding movement of said chuck and the blank for forming of a successive convolution.

3,937,052

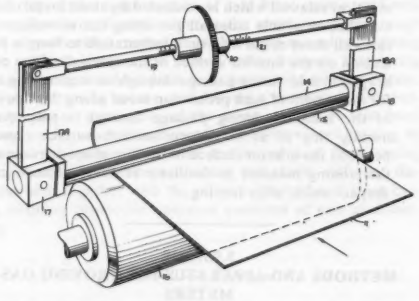
MACHINE FOR ROLLING AND CURVING PRINTING PLATES

Rolf Hoexter, and Thomas M. Morris, both of Fort Lee, N.J., assignors to Mosstype Corporation, Waldwick, N.J.

Filed Jan. 29, 1975, Ser. No. 545,210

Int. Cl.² B21D 5/14

U.S. Cl. 72—166 11 Claims



1. A machine for rolling and curving a metallized printing plate to conform it to the circumference of a printing cylinder, said machine comprising:

A. a deflection bar having a longitudinal groove therein which accommodates and partly recesses a forming roller of small diameter fabricated of a relatively unyieldable material, said deflection bar reinforcing said forming roller,

B. a driving roller of relatively large diameter cooperatively disposed with respect to said forming roller and covered by a yieldable elastomeric material,

C. means to adjust the position of said driving roller relative to said forming roller to vary the pressure applied to a printing plate admitted into the nip between said rollers, and

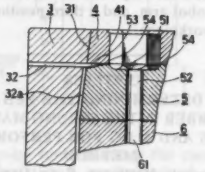
D. power means to rotate said driving roller whereby the plate advancing through said nip is forced by the working surface of the driving roller to wrap against the unyieldable forming roller under high pressure, thereby curving the plate.

3,937,053

FORMING DIE STRUCTURE

Mototsugu Akamatsu, 2-36 Nishi-Tamiyacho, Hirakata, Osaka, Japan

Filed Aug. 27, 1974, Ser. No. 500,955
Int. Cl.² B21J 13/02
U.S. Cl. 72—352 6 Claims



1. A forming die having an upwardly open die cavity therein, comprising:

an upper die member of hard material having the upper portion of said die cavity extending therethrough;

a lower die member of hard material abutting a lower surface of said upper die member and having the lower portion of said die cavity formed therein, including an upwardly facing bottom surface of said cavity;

a stock die member underlying and abutting said lower die member and being of softer and more resilient material than said upper and lower die members;

an air vent passage extending from the exterior of said die to the interface between said upper and lower die members adjacent but spaced outwardly from said die cavity, said passage opening slightly upon the downward movement of said lower die as said stock die compresses, and said passage immediately closing thereafter whereby metal cannot enter said passage; and

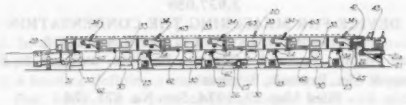
a reinforcing ring member tightly surrounding said upper, lower and stock die members and holding the same in said described relationship.

3,937,054

HEAVY DUTY PIPE SPREADER

Douglas R. Hortvet, and Norman C. Bennett, both of Houston, Tex., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Sept. 10, 1974, Ser. No. 504,737
Int. Cl.² B21D 41/02
U.S. Cl. 72—393 14 Claims



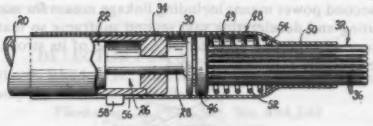
1. A heavy duty pipe spreader comprising: a base support; a boom pivotally connected to said base support; a plurality of like sets of spreader means connected to said boom and spaced there along, each of said sets comprised of a pair of pivoted spreader arms having pipe engaging means thereon; a pull rod disposed on said boom; means to reciprocate said pull rod along its axis relative to said boom; and like wedge means spaced along said pull rod for each set of spreader means, each said wedge means engaging a pair of said spreader arms, said wedge means being fastened to said pull rod; whereby when said pull rod is actuated to draw said wedge means towards said spreader arms said pipe engaging means are simultaneously brought into contact with the interior wall of a pipe telescoped onto said boom so as to effect the desired spreading of said pipe along its full length.

3,937,055

METHOD OF PEENING AND PORTABLE PEENING GUN

Vincent P. Caruso, Huntsville, and Elbert J. Minter, Decatur, both of Ala., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1974, Ser. No. 521,602
Int. Cl.² B21D 41/00; B21J 7/16
U.S. Cl. 72—399 2 Claims



1. In a portable peening gun of the type having a hammer supported for axial reciprocation along a rectilinear path and a pneumatic motor for driving the hammer in a first direction along the rectilinear path, the improvement comprising:

A. an axially reciprocable rod bundle including a plurality of peening rods, each being characterized by an anvil defined at one end thereof for receiving the hammer in impacting engagement as the hammer is driven in said first direction;

B. means supporting said rod bundle within the path of said hammer including a barrel of a substantially tubular configuration supported in coaxial alignment with the hammer and concentrically related to the rod bundle;

C. a retainer for confining the plurality of peening rods in closely spaced relation within the bundle, including a retainer of a disk-shaped configuration and characterized by a plurality of uniformly spaced bores extended therethrough for receiving the peening rods;

D. means for driving said hammer in a second direction, opposite to said first direction, including a helical spring disposed within the barrel in concentric relation with the rod bundle seated against the retainer for continuously urging said bundle in displacement toward said hammer; and

E. means defining a peening surface of a substantially hemispheric configuration at the end of each of said peening rods, opposite said one end, characterized by a radius substantially equal to one-half the thickness of the rod at the end of which the surface is defined.

2. In a method of peening the surface of a metallic body for inducing therein residual compressive stresses, the step of:

simultaneously impacting against a selected surface of a metallic body to be peened, a closely spaced plurality of peening surfaces of hemispheric configurations defined at the ends of a plurality of axially reciprocating, closely spaced peening rods for thus forming in said selected surface a plurality of closely spaced indentations of substantially hemispheric configurations, whereby residual compressive stresses are imparted to the surface of said body.

3,937,056

WORKPIECE TRANSLATION MECHANISM FOR TRANSFER DIE PRESS

William G. Henzler, Sylvania, and Robert A. Parker, Toledo, both of Ohio, assignors to Henzler Mfg. Corporation, Toledo, Ohio

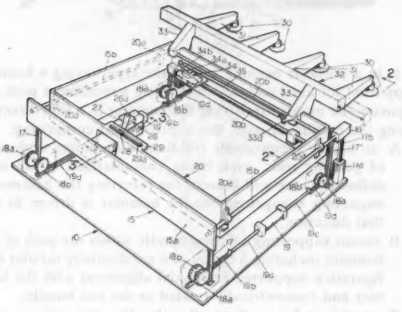
Filed Mar. 25, 1975, Ser. No. 561,864
Int. Cl.² B21D 43/05
U.S. Cl. 72—405 2 Claims

1. A workpiece transfer mechanism for a multistation die of a transfer press comprising, in combination:

1. A main frame structure disposed adjacent said transfer press and fixedly secured relative thereto;

2. A first subframe disposed in overlying relationship to said main frane, first power means for vertically reciprocating said first frame relative to said main frame, the extent of said vertical movement corresponding to the vertical movement required to lift a workpiece out of a die station;

3. A second subframe slidably mounted on said first subframe for horizontal reciprocating movement in a direction transferse to the progressive movement of the workpieces through the successive stations of said die, second power means for reciprocating said second subframe, said second power means including linkage means for accelerating and decelerating said second subframe so that said second subframe approaches each end of its stroke with essentially zero velocity; and



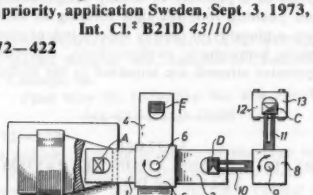
4. A third subframe slidably mounted on said second subframe for horizontal reciprocating movement in a direction parallel to the progressive movement of the workpieces through the successive stations of said die, a plurality of workpiece holders mounted on said third subframe and projecting toward said die, the stroke of said movement of said third subframe being equal to the spacing of the stations of said die, third power means for reciprocating said third subframe through said stroke, said third power means including linkage means for accelerating and decelerating said third subframe so that said third subframe approaches each end of its stroke with essentially zero velocity.

3,937,057

MANIPULATOR SYSTEM

Sten Trolle, Ystad, Sweden, assignor to AB Carbox, Ystad, Sweden

Filed Aug. 29, 1974, Ser. No. 501,685
Claims priority, application Sweden, Sept. 3, 1973, 7311956
Int. Cl.² B21D *43/10*
U.S. Cl. 72—422 5 Claims



1. In combination with a press (7) a manipulator system adapted automatically to supply to the press workpieces to be treated by the press in several consecutive steps, and automatically to remove treated articles from the press, comprising a revolver table (5) rotatable around a vertical axis (6) and having a number of arms (1–4) corresponding to the number of workings steps to be performed by the press, each revolver arm (1–4) having a tool set movable through the gap of the press;

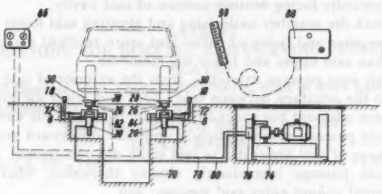
and, a robot (8) having at least two arms (10, 11) movable in a horizontal plane between a first position for picking up an untreated workpiece, a second position for placement of a workpiece between the tool set of a revolver table arm, located adjacent the second position of the respective robot arm, and a third position for delivery of a finished workpiece.

3,937,058

METHOD OF DETERMINING THE BEHAVIOUR OF A SHOCK ABSORBER IN THE SPRUNG MASS SYSTEM OF A VEHICLE AND A JIG FOR PERFORMING THE METHOD

Jan Willem Hilbrands, Hattingen, Ruhr, Germany, assignor to Maschinenfabrik Koeppern & Co. KG, Germany

Continuation of Ser. No. 268,452, July 3, 1972, abandoned.
This application Nov. 6, 1974, Ser. No. 521,409
Claims priority, application Germany, July 3, 1971, 2133234
Int. Cl.² G01M *17/04*
U.S. Cl. 73—11 23 Claims



18. A method for determining the behavior of a shock absorber arranged in a wheel suspension unit within the sprung mass system of a vehicle, comprising the steps of causing the wheel to vibrate by applying forces to the wheel in a cycle according to a predetermined relationship of amplitude to frequency, measuring the magnitude value of the vertical contact force applied by the wheel to a support surface while subjecting the wheel to such applied forces, and determining whether the measured vertical contact force exceeds a predetermined minimum contact force when the wheel is subjected to such applied forces as an indication of the useability of the shock absorber.

3,937,059

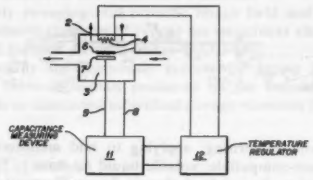
DEVICE FOR MEASURING THE CONDENSATION TEMPERATURE OF A GAS OR A VAPOR

René Nisolle, Braine-Le-Compte, Belgium, assignor to Solvay & Cie., Brussels, Belgium

Filed May 17, 1974, Ser. No. 471,174
Claims priority, application France, May 23, 1973, 73.18828
Int. Cl.² G01N *25/68*
U.S. Cl. 73—17 A 6 Claims

1. Device for measuring the condensation temperature of an organic or inorganic vapor or gas, comprising two electrically conductive plates insulated electrically from one another and spatially separated from one another by a space free of any solid material and arranged to contain such gas or vapor, one of said plates presenting a surface on which a condensate of such gas or vapor is deposited under appropriate conditions; cooling means operatively associated for cooling said surface through a temperature range containing the temperature at which such gas or vapor will begin to condense; a temperature measuring device positioned as close as possible to said surface for providing an indication of the temperature of said

surface; said insulated plates forming an electric capacitor of a given capacitance when the space which separates them is occupied by a vapor or gas and of a markedly different capacitance when a condensate is deposited on said one of said



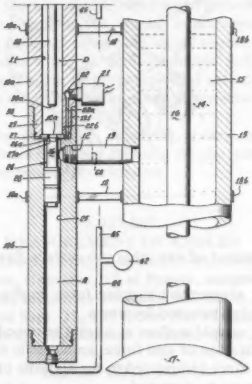
plates; and a device for measuring the capacitance of said capacitor and detecting a predetermined variation in this capacitance, the temperature to be measured being that given by said temperature measuring device at the instant when this variation is detected.

3,937,060

MUD GAS CONTENT SAMPLING DEVICE

George E. Lewis, Arcadia, and Charles P. Peterman, South Laguna, both of Calif., assignors to Hydril Company, Los Angeles, Calif.

Filed Feb. 6, 1974, Ser. No. 439,892
Int. Cl.² G01N 7/14; E21B 47/00
U.S. Cl. 73—19 **14 Claims**



1. In a drilling mud gas content detector, the combination comprising

a. a housing defining a mud sample chamber, and having a first bore and a port communicable with well piping containing pressurized mud,

b. a first plunger movable in the first bore in one direction to return a mud sample in the chamber out said port to said piping, and movable in the opposite direction in the first bore to ingest a pressurized mud sample into said chamber via said port, and

c. valve means controlling said port and responsive to plunger movement in said opposite direction to block flow of mud to the sample chamber prior to subsequent completion of said plunger movement in said opposite direction which effects a predetermined volume increase producing a reduction of pressure exerted by the sample in the chamber, said pressure reduction being indicative of the mud gas content.

d. whereby the fluid pressure of the sample in the chamber may be sensed by a sensor in communication with said chamber both prior to and subsequent to said pressure reduction,

e. said valve means including a second plunger movable in a second bore defined by said housing in response to first plunger movement, said first plunger disengaging the second plunger upon closing of said port and prior to said completion of opposite direction movement of the first plunger,

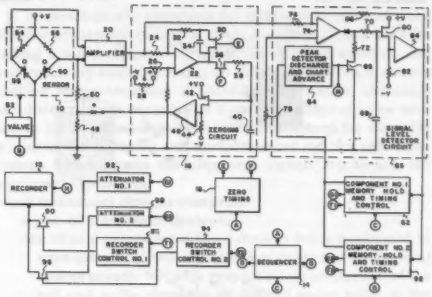
f. the first plunger having a primary piston surface to receive fluid pressure application in a third bore defined by the housing and tending to urge the first plunger in said opposite direction.

3,937,061

DETECTOR FOR A CHROMTOGRAPH

Charles F. Rhodes, Jr., Richardson, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Aug. 2, 1974, Ser. No. 494,248
Int. Cl.² G01N 31/00
U.S. Cl. 73—27 R **11 Claims**



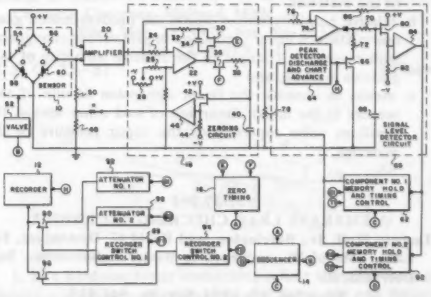
1. A gas chromotography circuit for detecting a parameter of a component of a gas, comprising: sensor means that produces signals indicative of parameters of the gas component; means connected to the sensor means for providing a signal whose level bears a relationship to the signals produced by the sensor means; means for amplifying the signal produced by the providing means; means for storing the amplified signal; and means for feeding back a portion of the stored signal into the amplifying means.

3,937,062

ZEROING CIRCUIT

Charles F. Rhodes, Jr., Richardson, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Filed Aug. 2, 1974, Ser. No. 494,249
Int. Cl.² G01N 31/00
U.S. Cl. 73—27 R **8 Claims**



1. In a circuit for detecting a parameter of a component of a gas in a gas chromotography, sensing means comprising: means for producing a signal having a predetermined level when a component of the gas is not present; means for generating a signal indicative of a variance of the signal from the

predetermined level; first feedback means between the variance signal generating means and the signal producing means, said first feedback means having first electronic switch means and means for storing the variance signal; second feedback means around the variance signal generating means, said second feedback means having second electronic switch means; and means for operating the first and second electronic switch means in a timed relationship with the introduction of gas into the chromotograph.

3,937,063

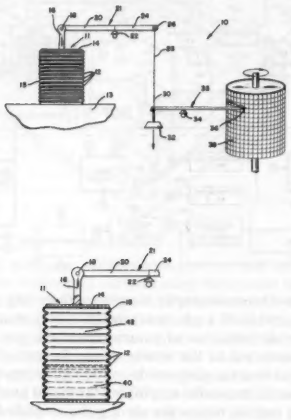
VAPOR PRESSURE METERING APPARATUS AND METHOD

Lancelot I. Kethley, 1454 36th Ave. Apt. 6, Oakland, Calif. 94601

Continuation-in-part of Ser. No. 369,838, June 14, 1973, abandoned. This application June 28, 1974, Ser. No. 484,128

Int. Cl.² G01W *1/06*

U.S. Cl. 73—29 **9 Claims**



1. A device for continuously measuring the vapor pressure of the vapor phase of a material within a gaseous mixture comprising:

a. saturation vapor pressure sensor including a closed container of at least two phases of the material, one of which is the vapor phase in the predetermined gaseous mixture, a linear dimension of said container being changeable with respect to changes in the saturation vapor pressure of the material;

b. relative humidity sensor within the predetermined gaseous mixture, a linear dimension of said sensor changeable with respect to changes in the relative humidity of said gaseous mixture; and

c. means to contrast the linear dimension of one of said sensors to the linear dimension of said other sensor, the resultant value representing the vapor pressure of the material.

3,937,064

MEMBRANE LEAK CHECKING TECHNIQUE

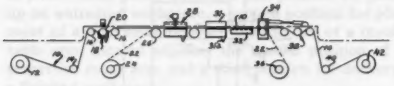
Ludwig Wolf, Jr., Barrington, and David G. Dominguez, Fox Lake, both of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Jan. 17, 1975, Ser. No. 541,815

Int. Cl.² G01M *3/04*

U.S. Cl. 73—40 **10 Claims**

1. In a method for testing a membrane strip for leaks due to pin holes in said strip by applying a detector fluid to one face of said strip while bringing a detection medium into proximity with the other face of said strip, and producing a pressure difference between opposite faces of the strip in a sense to cause flow of the detector fluid through any open holes in said strip and into contact with the detection medium, the improvement comprising: applying to said membrane strip a membrane-compatible, volatile liquid medium to fill said pin holes and to be retained therein by capillary attraction, to prevent the flow of detector fluid through pin holes which are less than a predetermined size.



3,937,065

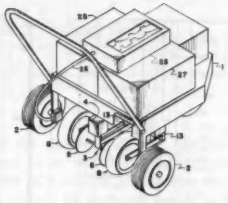
DELAMINATION DETECTOR

Lionel J. Milberger; Gilbert Swift, both of Bryan, and William M. Moore, College Station, all of Tex., assignors to William Moore and G. Swift, both of College Station, Tex.

Division of Ser. No. 176,906, Sept. 1, 1971, Pat. No. 3,762,496. This application June 12, 1973, Ser. No. 369,187

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67 **9 Claims**



1. The method of detecting sub-surface flaws in a material comprising:

Applying a repetitive tapping force to the surface of the material at selected locations,

detecting on said surface at a point removed from the point of application of said force, an acoustic response related to said force and related to the acoustic characteristics of the flaw to be detected,

producing, by time gating and frequency filtering of said detected response, an indication which is related to the distinguishing characteristics of the flaws to be detected, and whereby extraneous effects are diminshed, said time gating admitting only the initial portion of the acoustic response produced by each individual application of the repetitive tapping force.

3,937,066

ULTRASONIC CAMERA SYSTEM AND METHOD

Philip S. Green, Redwood City; Hugh F. Frohbach, Sunnyvale; Louis F. Schaefer, Palo Alto, and Joe R. Suarez, Fremont, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Nov. 1, 1973, Ser. No. 411,729

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.5 R **33 Claims**

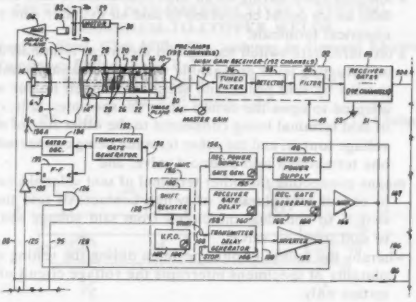
26. In a method of producing an electrical signal representative of an acoustic image field traveling in a fluid medium comprising:

generating ultrasonic waves to insonify an object under observation;

receiving at a plurality of acoustic transducer elements at least a portion of an acoustic image field from the object and focused at the transducer elements;

relatively sweeping said acoustic image field and acoustic transducer elements to expose the transducer elements to a full focused acoustic image field;

substantially simultaneously recurrently gating for short time intervals signals produced by the transducer elements to associated individual storage elements for recurrently simultaneously storing in the storage elements the instantaneous value of signals related to the signals produced by the associated transducer elements;



sequentially sampling the stored instantaneous value of signals to obtain a composite signal representative of at least a portion of the acoustic image field in a plane normal to the line of propagation of the acoustic image field from the object to the acoustic transducer elements, and

repeating the generating, receiving, gating, and sampling steps without affecting focusing of the acoustic image field at the transducer elements.

3,937,067

MEASUREMENT OF ANGLES

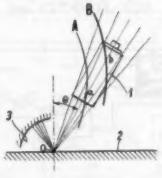
Christian Flambard, Gagny; Alain Lambert, Creil, and Miguel Sancho Pavon, Gouvieux, all of France, assignors to Centre Technique des Industries Mechaniques, Senlis, France

Filed Sept. 27, 1974, Ser. No. 510,022

Claims priority, application France, Mar. 19, 1974, 74.09182

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.7 **15 Claims**



1. A method of measuring the angular position of an ultrasonic beam comprising the steps of: projecting the ultrasonic beam by a transmitting probe onto a fixed point of a surface, receiving the beam from said point by a receiving probe, varying the length of the path traversed by the ultrasonic beam from said transmitting probe to said receiving probe in accordance with a relationship determined as a function of the angular displacement of the transmitted beam with respect to said surface, and detecting the time taken by the ultrasonic beam for traversing said path.

3,937,068

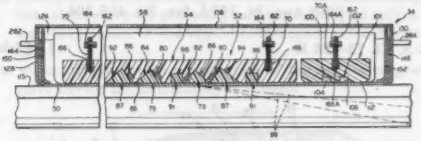
TRANSDUCER ARRANGEMENT FOR ULTRASONIC RAIL TESTER COUPLING CARRIAGES

Ivan L. Joy, 415 Delaware Drive, Ozawkie, Kans. 66070

Filed Feb. 25, 1974, Ser. No. 445,080

Int. Cl.² G01N 29/04

U.S. Cl. 73—67.7 **2 Claims**



1. In an ultrasonic apparatus for progressive railroad track rail flaw testing for detecting flaws in railroad track rails including a multi-element ultrasonic signal pulse emitting and echo receiving assembly riding on the rail head in its operative position and comprising a plurality of separate ultrasonic transducer devices mounted in a carriage adapted to be coupled to the rail head in the operative position of the assembly by means for damping out surface waves on the rail head, through which means the ultrasonic signals are to act, the improvement wherein:

said transducer devices comprise:

a pair of transducer devices,

one of said pair of transducer devices being positioned to emit ultrasonic test signal pulses canted at an angle of approximately 80° with respect to the centerline of the rail and in the direction of the rail gauge edge, in the operative position of the assembly,

said devices of said pair of devices being spaced longitudinally of the rail in the operative position of the assembly for permitting the signal pulses of said one device of said pair of devices to make a zig-zag path across the rail head

said pair of transducer devices being located in the assembly to be disposed, in the operative position of the assembly, at the center of, and on top of, the top surface of the rail head and to act at an angle of incidence relative to the rail head top surface to produce in the rail as a result of their signal impulses ultrasonic waves travelling at flat angles on the order of 80° to 85° relative to the level of the rail head top surface.

3,937,069

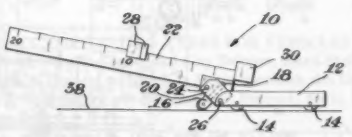
HARDNESS TESTER

Frank L. Saunders, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 28, 1975, Ser. No. 563,038

Int. Cl.² G01N 3/42

U.S. Cl. 73—81 **3 Claims**



1. In a hardness tester comprising a four wheeled carriage having a scale arm pivotally mounted from one end thereof and supporting a pressure application member in a fixed position with respect to said scale arm whereby said pressure application member contacts a surface to be tested when said wheeled carriage is rolled along said surface, the improvement wherein:

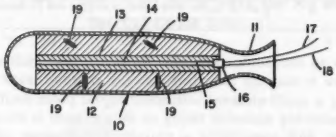
said pressure application member comprises a ball-like fluted member mounted to rotate along a line which is parallel to any forward movement of said wheeled carriage.

3,937,070

METHOD AND SENSORS FOR PREDETERMINING DYNAMIC MODULI IN SITU OF CASTABLE-TYPE MATERIAL

Herman P. Briar, Rancho Cordova, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Apr. 29, 1974, Ser. No. 465,206
Int. Cl.² G01L 1/16
U.S. Cl. 73—88 R **13 Claims**



3. A sensor for determining the dynamic properties of a castable material within which it is embedded comprising:

an electrically conductive spacing member of a material insoluble in said castable material and having a pair of opposed planar faces;

a first piezoelectric crystal having a modulus of elasticity between approximately one-half and one-third that of said spacing member secured to one of said planar faces of said spacing member in an air-tight manner and having a conductive layer on the other of its planar faces; and

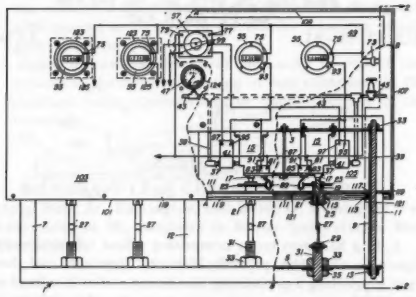
a second piezoelectric crystal having a modulus of elasticity between approximately one-half and one-third that of said spacing member secured to the other planar face of said spacing member in an air-tight manner and having a conductive layer on the other of its planar faces, the mean modulus of elasticity of said combined crystals and spacing member being substantially greater than the modulus of elasticity of said castable-type material.

3,937,071

FATIGUE TEST APPARATUS

Stanley A. Slota, Sparta, and Raymond F. Wegman, Ledgewood, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 11, 1975, Ser. No. 595,256
Int. Cl.² G01N 3/32
U.S. Cl. 73—91 **6 Claims**



1. Fatigue testing apparatus comprising: a rigid support frame, a plurality of test stations mounted on said support frame; a source of air pressure and a manifold for conducting air from said source to said stations; a voltage source; and a program timer switch comprising a plurality of switch contacts, one for each of said test stations, and means for connecting one side of said voltage source to each of said contacts in a predetermined sequence; each of said test stations including:

first and second spaced specimen holders adapted to be attached to opposite ends of a specimen to be tested, said first specimen holder being attached to said support frame;

an air cylinder attached to said support frame and having a piston to which said second specimen holder is attached;

a solenoid valve having an air inlet connected to said manifold, an air outlet connected to said air cylinder, and two electrical terminals;

a test terminate switch having two electrical terminals and an actuating lever engageable with an actuating member carried by said piston and second specimen holder and adapted to open the switch when the specimen fails, one of said terminal being connected to the other side of said voltage source, and the other terminal being connected to one terminal of said solenoid valve; and

means connecting the other terminal of said solenoid valve to one of said plurality of switch contacts of said timer switch, to complete the circuit from said voltage source to said solenoid valve;

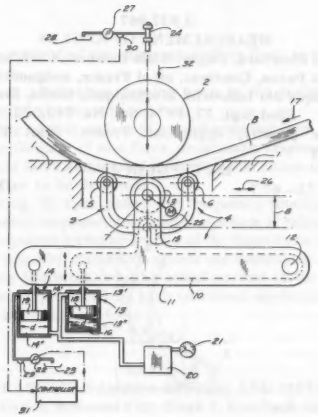
whereby the failure of one specimen during the testing of a plurality of specimens interrupts the voltage circuit of its station only.

3,937,072

SYSTEM FOR MEASURING PLASTIC DEFORMATION CREATED BY A BENDING PRESS

Eduard J. C. Huydts, Dusseldorf; Alfons Klassen, Krefeld, and Erich Nacke, Sevelen, all of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Filed June 5, 1974, Ser. No. 476,402
Claims priority, application Germany, June 6, 1973, 2328695
Int. Cl.² G01N 2/20
U.S. Cl. 73—100 **6 Claims**



1. A method of measuring the permanent bend in a workpiece clamped in a bending press with its one side lying on a pair of beams spaced apart in a transport direction and with a bending roller pressing in a bending direction transverse to said transport direction against the other side of the workpiece and between said beams, said method comprising the steps of:

pressing a first feeler against said one side of said workpiece at a first location opposite said bending roller with a force

sufficient to move said workpiece and relieve substantially all of the elastic deformation in said workpiece;

contacting said workpiece on said one side with second and third feelers at respective second and third locations spaced from said first location in said transport direction; and

measuring the distance between said first feeler and said second and third feelers in said bending direction, said distance being proportional to the permanent bend in said workpiece.

3,937,073

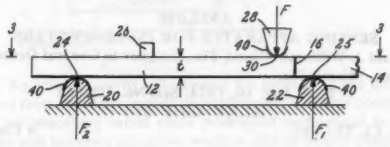
METHOD OF NON-DESTRUCTIVELY TESTING ALUMINUM-TO-COPPER WELDS

Robert B. Steel, Glen Mills, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Feb. 20, 1975, Ser. No. 551,556

Int. Cl.² G01N *3/24*

U.S. Cl. 73—101 **12 Claims**



1. A method of non-destructively testing an aluminum-to-copper butt weld in a bar comprising an aluminum section and a copper section joined together by said weld, said weld extending transversely of said bar, said method comprising:

a. applying first and second forces to the bar at spaced locations disposed relative to the bar on opposite sides of said transversely extending weld, with the weld being located closely adjacent the location at which one of said forces is applied to the aluminum section of the bar,

b. applying to said copper section in a location adjacent said weld a third force that cooperates with said first and second forces to non-destructively load said weld primarily in shear, and said forces being sufficiently high to produce shear stresses at said weld of at least several thousand pounds per square inch, and

c. sensing the acoustic emission signal resulting from the loading of said weld by said forces.

3,937,074

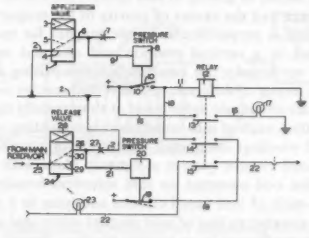
APPARATUS FOR CHECKING INTEGRITY OF MAGNET VALVES IN ELECTRO-PNEUMATIC BRAKE SYSTEMS

Richard O. Burkett, Apollo, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 26, 1974, Ser. No. 500,412

Int. Cl.² G01L *5/28*

U.S. Cl. 73—121 **7 Claims**



1. Testing apparatus for checking the integrity of the electrical portion of an electro-pneumatic brake system for a railway train vehicle, the pneumatic portion of which comprises a brake pipe from which fluid pressure is released for effecting a brake application and to which fluid pressure is supplied for releasing the application, and the electrical portion of which comprises an application magnet valve device effective, when energized, for venting the brake pipe to atmosphere and, when deenergized for cutting off such venting, and a release magnet valve device effective, when energized, for causing recharging of said brake pipe with fluid pressure and, when deenergized, for cutting off such recharging, and a trainline release wire, said testing apparatus comprising:

a. means responsive to energization of the application magnet valve device for providing a continuous signal indicating energization of the application magnet valve device; and

b. means responsive to energization of the release magnet valve device for terminating said signal.

3,937,075

TRANSDUCER COMPRISING STRAIN GAUGES

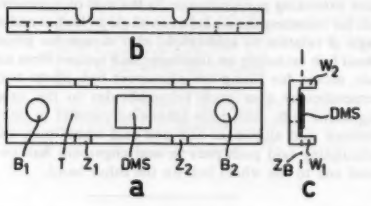
Gunther Friedrich Landvogt, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1974, Ser. No. 513,710

Claims priority, application Germany, Oct. 16, 1973, 2351810

Int. Cl.² G01L *5/00*

U.S. Cl. 73—141 A **9 Claims**



1. A force-measuring transducer comprising, an elongate support member having a neutral zone in an area intermediate the ends of the support member at which substantially no tensile or compression forces occur when the support member is subjected to a bending force, at least one strain gage engaging a surface portion of the support member at said intermediate area of the support member, means located at both ends of the support member and outside said intermediate area for securing the support member to an object to be measured, said support member including first and second zones of lower bending rigidity than exists at said intermediate area and provided without a substantial reduction of the support member cross-section, said first and second zones being located respectively between the securing ends of the support member and said intermediate area at which the strain gage is positioned.

3,937,076

DEVICE FOR TESTING TYRES FOR VEHICLES

Olivier Pommellet, St-Cloud, and Guy Drioton, Rueil-Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed June 6, 1974, Ser. No. 477,002

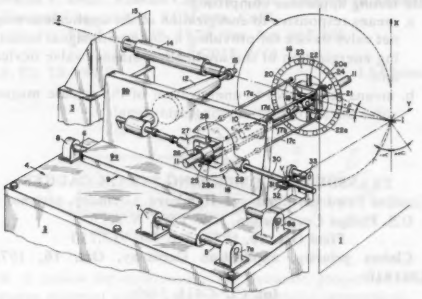
Claims priority, application France, June 6, 1973, 73.20621

Int. Cl.² G01M *17/02*

U.S. Cl. 73—146 **23 Claims**

1. A device for testing vehicle tyres comprising frame means, means supported by said frame means and defining a track, means for driving said track for movement along a given direction relative to said frame means, carriage means supported by said frame means, means slidably interconnecting

said carriage means and said frame means for movement of said carriage means along a direction transverse to said given direction and extending towards and away from said track, means for driving said carriage for sliding movement along said transverse direction towards and away from said track, means for freely rotatably supporting a wheel and tyre combination on said carriage with said tyre in rolling contact with said track, said wheel supporting means including a wheel hub, and means for pivoting said wheel hub about two direc-



tions extending perpendicular to the axis of symmetry of said hub for orienting the wheel at an angle of lock α and a camber angle β relative to said track, said means for pivoting said wheel hub including an alignment hub spaced from said wheel hub, means for tilting the alignment hub about two further perpendicular axes each perpendicular to the axis of said alignment hub, push rods extending parallel to one another between said alignment hub and said wheel hub, and means articulating said push rods to said alignment hub on the one hand and to the wheel hub on the other hand.

3,937,077

TIRE PRESSURE INDICATORS AND METHODS OF MAKING AND USING THE SAME

Robert L. Klamm, 230 Spring Drive, St. Charles, Mo. 63301

Continuation-in-part of Ser. No. 182,365, Sept. 21, 1971. This application Nov. 12, 1973, Ser. No. 414,673

Int. Cl.² B60C *23/04*

U.S. Cl. 73—146.8 **3 Claims**

1. An air pressure indication device for use on conventional automobile tires, said tires provided with a valve stem containing a Schrader valve or similar valve, comprising,

housing means, said housing means provided with an elongated chamber therein and said housing means provided with an inlet port and an outlet port, said inlet and outlet ports operably coupled to said chamber, and said outlet port communicating with the air in said tire,

a support member operably mounted in said chamber,

said inlet port threaded to mount on a conventional valve stem,

air pressure measuring means operably mounted in said chamber, said air pressure measuring means comprising an aneroid bellows pressure measuring means and indicating means operably mounted thereon, wherein said aneroid bellows pressure measuring means comprises,

a bellows operably mounted within said chamber, said bellows provided with a bellows chamber therein, said bellows being evacuated and air sealed, a first end of said bellows being attached to said support members,

indicating means operably mounted on the second end of said bellows,

a calibration spring operably mounted between said support member and said indicating means and disposed about said bellows,

window means operably mounted in said chamber wall, said window means disposed such that when the air pressure in said tire varies, a particular portion of said indicating means is visible through said window,

valve means (conventional Schrader valve or similar valve) operably mounted in said outlet port,

said air pressure indication means provided with through ports, said through ports adapted to allow the tire to be filled while the device is installed on a tire.

3,937,078

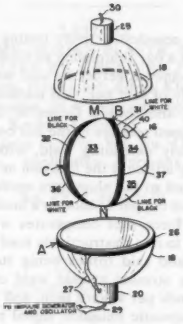
SENSING APPARATUS FOR INCLINOMETERS

Gerald J. Williams, Miami, Fla., assignor to General Oceanus, Inc., Miami, Fla.

Filed Apr. 10, 1974, Ser. No. 459,658

Int. Cl.² G01P *5/06*

U.S. Cl. 73—189 **4 Claims**



1. Apparatus for sensing the direction and amplitude of tilt of an inclinometer for measuring the force velocity and direction of a current of a body of water movement comprising a cylindrical housing having end caps thereon, a spherical housing contained within said cylindrical housing, said spherical housing attached to an end cap a movable sphere within said spherical housing, a fluid contained within said spherical housing maintaining said sphere in spaced relation to said spherical housing, means for tethering said cylindrical housing in a body of water, a bar magnet mounted within said sphere below the center of gravity of said sphere, the center of gravity of the sphere and the center of gravity of the magnet defining a line which is perpendicular to the magnet for maintaining said sphere in a vertical position and oriented toward the magnetic north pole, the combination comprising a plurality of tuned circuits of different resonant frequencies mounted in great circles about said sphere and at substantially right angles to each other, each of said tuned circuits consisting of a plurality of coil windings connected in series with a capacitor, one of said tuned circuits lying in a common plane with said magnet, a drive coil mounted on said spherical housing at right angles to each of said tuned circuits and lying in a plane substantially parallel to that of said magnet when said cylindrical housing is positioned in an upright position, means for applying an impulse of electric current to said drive coil whereby a voltage impulse is induced in said tuned circuits causing said

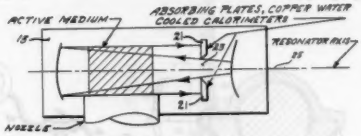
tuned circuits to oscillate inducing signals in said drive coil that indicate the amount of tilt of said cylindrical housing with relation to said sphere and further means for distinguishing the directions of tilt of said cylindrical housing.

3,937,079

CALORIMETER FOR AN UNSTABLE LASER RESONATOR

Richard A. Chodzko, Palos Verdes Peninsula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 11, 1974, Ser. No. 531,645
Int. Cl.² G01K 17/00
U.S. Cl. 73—190 EW 4 Claims



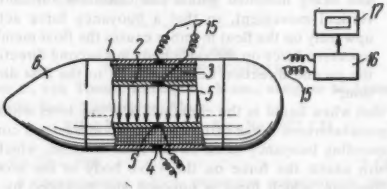
1. An internal cavity calorimeter for measuring the output power from an edge coupled unstable laser resonator comprising, an absorbing metal plate positioned orthogonal to the cavity axis between the active medium and an output coupling mirror, said plate having an aperture in the central portion thereof, means for varying the size and shape of the aperture in said absorbing metal plate including four separate leaves in perpendicular relationship to one another, each of said leaves being independently movable to produce a corresponding variation of the unstable cavity geometric mode independently for a fixed cavity magnification, and means for independently measuring the power absorbed by each leaf, thereby indicating the lasing intensity distribution pattern for the unstable laser resonator while containing the radiation within the cavity.

3,937,080

ELECTROMAGNETIC APPARATUS FOR MEASURING THE FLOW VELOCITY OF AN ELECTRICALLY CONDUCTIVE FLUID AND METHOD OF CALIBRATION THEREOF

Izrail Grigorievich Fix, ulitsa Artema, 108, kv. 61; Alexei Sergeevich Morokhovsky, ulitsa Cheljuskintsev, 184, kv. 6, both of Donetsk; Mikhail Yakovlevich Gammerman, Gustamyae Lee, 137, kv. 8, Tallin; Benno Abramovich Khaitin, Tammsaare Lee, 100, kv. 81, Tallin; Tynis Eduardovich Laar, Khaigru, 5, kv. 6, Tallin, and Volf Iolevich Mezhburd, Bulvar Karla Marxa, 78, kv. 26, Tallin, all of U.S.S.R.

Filed Aug. 31, 1973, Ser. No. 393,678
Int. Cl.² G01F 1/58
U.S. Cl. 73—194 EM 16 Claims



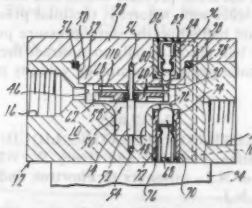
1. Electromagnetic apparatus for measuring the flow velocity of an electrically conductive fluid, the apparatus being positioned within the fluid flow and comprising a pair of pipe portions of different diameters, one pipe portion being placed within the other; means for producing a magnetic field in the fluid, said means being mounted between said pipe portions; means for sensing the electric potential developed in the fluid flow as a consequence of the produced magnetic field, said means being mounted at right angles both to the direction of the flow and to the direction of the produced magnetic field and consisting of two groups of electrodes of which the first one is mounted on the external surface of said outer pipe portion and serves for sensing the electric potential corresponding to the velocity of the fluid flow, and the second one is mounted on the inner surface of said internal pipe portion and serves for sensing the electric potential corresponding to the velocity of the fluid passing through this pipe portion, an indicator whereto one of said groups of electrodes is connected and which reads the measured fluid flow velocity.

3,937,081

VORTEX FLOWMETER

Karnig H. Dabanian, Farmington; Lawrence F. Rapp, Southfield, and Dale C. Good, Plymouth, all of Mich., assignors to Cox Instrument Division, Lynch Corporation, Detroit, Mich.

Filed Oct. 1, 1973, Ser. No. 402,075
Int. Cl.² G01F 1/06, 1/32
U.S. Cl. 73—194 C 16 Claims



1. A vortex flowmeter comprising a body structure having a cavity formed therein, said cavity having a varying diameter from a large diameter section to a small diameter section, an inlet port positioned generally tangential to said large diameter portion and an outlet port positioned adjacent said small diameter portion for permitting the flow of fluid through said cavity in a generally swirling manner, a rotor positioned in said cavity having a plurality of teeth formed thereon, spoiler means positioned adjacent said rotor and in fluid coupling therewith, said coupling creating a shear drag on said rotor to improve the down side response time of said rotor, and a pickup system positioned to sense the passage of said teeth in response to the flow of fluid in said cavity.

3,937,082

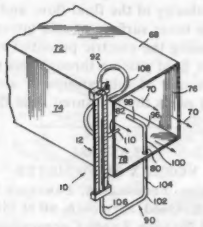
GAUGE SYSTEM FOR MEASURING AIR FLOW IN DUCTS

John E. Schilling, Indianapolis, Ind., assignor to Schilling Chilling Manufacturing Corporation, Indianapolis, Ind.

Filed Sept. 6, 1974, Ser. No. 503,862
Int. Cl.² G01G 1/34
U.S. Cl. 73—208 13 Claims

1. For use in measuring air velocity pressure in a duct, the velocity pressure corresponding to air velocity, a gauging system comprising a gauge including a vertically upwardly extending transparent gauge tube having an open lower end and an open upper end, said tube having a plurality of vertically spaced apart venting apertures in the side wall thereof, a vertically extending transparent shell enclosing said tube, said shell having an upper end extending above the upper end of said tube, said shell being closed at its lower end to the lower end of said tube, a light-weight ball movable in said tube to a vertical position corresponding to the pressure therein above and below said ball, and means providing an air velocity

scale extending alongside said tube and increasing from said lower end to said upper end, and in which the improvement comprises first tube means for connecting the lower end of said gauge tube to the interior of the duct, said first tube means having a distal end portion with an open end pointed upstream opposite to the direction of flow of air through the duct to read total pressure including velocity pressure and



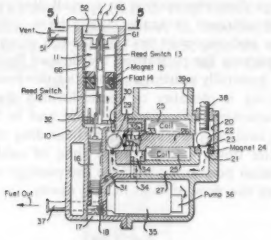
static pressure, and second tube means for connecting the upper end of said shell to the interior of said duct, said second tube means having a distal end portion with an open end pointed to read the static pressure within said duct through an opening in the duct wall, whereby, the total pressure pushes upwardly on said ball while the static pressure pushes downwardly on said ball automatically to subtract the static pressure from the total pressure to provide velocity pressure.

3,937,083

TEMPERATURE-COMPENSATING LIQUID METER

Daniel D. Sabatino, Paramus, and Henry W. Wilkens, Little Ferry, both of N.J., assignors to Flowtron Industries Inc., Little Ferry, N.J.

Filed Jan. 16, 1975, Ser. No. 541,478
Int. Cl.² G01F *11/00*
U.S. Cl. 73—224 **16 Claims**



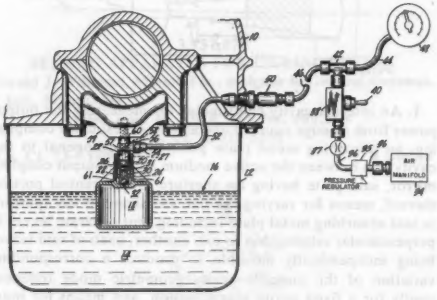
14. An automatically operable, temperature-compensated, liquid metering device comprising a measuring chamber having a pair of liquid-level sensors therein disposed in vertically spaced relation to one another, means responsive to the absence of liquid in said chamber at a first level determined by the lower one of said sensors for supplying a liquid to be measured to said chamber, means subsequently responsive to the presence of liquid in said chamber at a second level determined by the upper one of said sensors for terminating the supply of liquid to said second chamber, means for initiating a withdrawal of liquid from said chamber substantially simultaneous with the termination of the supply of liquid to said chamber to drain liquid from said chamber until the liquid level in said chamber falls below said first level so as to cause termination of said withdrawal operation and to reinitiate the supply of liquid to said chamber, whereby fixed increments of liquid each of which is volumetrically dependent upon the vertical spacing between said sensors are repetitively and automatically supplied to and thereafter withdrawn from said chamber, counter means controlled by at least one of said sensors for counting the number of said increments, and means responsive to the temperature of the liquid being measured for selectively varying the relative spacing between said sensors thereby to vary the volumes of said increments with variations in the temperature of said liquid.

3,937,084

LIQUID LEVEL INDICATOR

Walter M. May, Bethlehem, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.

Filed Apr. 26, 1974, Ser. No. 464,679
Int. Cl.² G01F *23/06*
U.S. Cl. 73—309 **6 Claims**



1. A liquid level indicator for a container adapted to contain a liquid comprising:

a. a source of fluid under pressure;

b. a fluid conduit system coupled to and communicating with the fluid source;

c. means defining a restriction orifice in the conduit system;

d. fluid pressure responsive gage means coupled to the conduit system downstream of the restriction orifice; and

e. valve means coupled to the conduit system downstream of the restriction orifice, the valve means including

i. a valve seat defining an orifice that communicates with the conduit system and is an outlet for fluid in the system;

ii. a valve body movable toward and away from the valve seat so as to vary the cross-sectional flow area of the orifice, the pressure of the fluid in the conduit system between the restriction orifice and the outlet orifice exerting a force on the valve body in a first direction; and

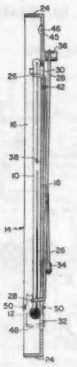
iii. a float member operatively coupled to the valve body and being mounted within the container for limited vertical movement, so that a buoyancy force acting upwardly on the float member causes the float member to exert a force on the valve body in a second direction, the second direction being opposite to the first direction;

so that when liquid in the container is at any level within a predetermined range of levels, the liquid exerts a corresponding buoyancy force on the float member, which in turn exerts the force on the valve body in the second direction, which force is opposed and balanced by the force exerted by the pressurized fluid on the valve body in the first direction, the pressure of the fluid in the conduit system between the restriction orifice and the outlet orifice being indicative of the level of liquid in the container.

3,937,085
THERMOMETER

Burton H. Harrison, Weston, Mass., assignor to Selective Educational Equipment, Inc., Newton, Mass.

Filed Feb. 3, 1972, Ser. No. 223,103
Int. Cl.² G01K 1/14
U.S. Cl. 73—338.6 12 Claims



1. A temperature responsive measuring device preferably for use by students and having an elongated thermometer tube that is readily replaceable, said device comprising:

an elongated backing having a front surface of concave configuration along its length, said front surface being defined by a pair of sidewalls diverging from an apex;

a temperature scale disposed on said forward surface of at least one of said sidewalls;

and means for mounting the thermometer tube within and along the concave apex of said backing, said sidewalls extending forwardly of and substantially beyond said thermometer tube to protect said tube;

said means for mounting said thermometer tube comprising;

a first hole formed in the upper portion of said backing,

a second hole formed in the lower portion of said backing,

first and second posts extending rearwardly from and spaced along the rear surface of said backing and each disposed adjacent but spaced from respective first and second holes,

and at least one continuous and endless elastic band having a first segment extending through the first hole and being looped about the upper end of said thermometer tube, and a second segment that is stretched downwardly to extend and wrap about said rearwardly extending second post,

whereby said thermometer tube may be readily replaced by removing the second segment from the post so as to loosen the first segment and permit easy withdrawal of the tube from the backing.

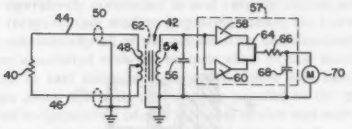
3,937,086
NOISE THERMOMETER

Peter C. von Thuna, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Nov. 8, 1974, Ser. No. 522,121
Int. Cl.² G01K 7/30
U.S. Cl. 73—359 7 Claims

1. A thermometer which measures spontaneous thermal noise in the form of voltage fluctuations across a sensor resistor, said thermometer comprising in combination:

an electrical circuit inductively coupled to said resistor and being tuned so that the losses in said circuit are substantially caused by said sensor resistor, the parameters of said circuit being so matched to the sensor resistor and the inductive coupling that the thermal noise power generated by said resistor is concentrated in a selected frequency band, said inductive coupling being a transformer, the primary of which is connected across said



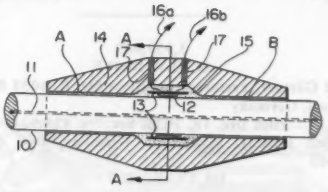
resistor, said electrical circuit including the secondary winding of said transformer and a precision capacitor connected across said secondary winding; and

means connected in said electrical circuit for measuring the absolute mean square value of said voltage fluctuations.

3,937,087
TRANSDUCER FOR ENGINE FUEL INJECTION MONITORING

William S. Heggie, Ottawa, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed July 5, 1974, Ser. No. 486,189
Int. Cl.² G01L 9/04
U.S. Cl. 73—398 AR 5 Claims



1. A fuel injection pressure monitoring transducer for mounting on the fuel injection lines of diesel engines comprising at least one strain detector mounted on the circumference of the fuel line tube such that expansion and contraction of the tube cause variations of the output of the detector, a plastic sleeve covering the resistance element at least in some part, a torpedo-shaped housing made of strong metal encompassing the tube and the resistance element mounted thereon and rigidly attached to the tube circumferentially at outer positions away from the resistance element, the housing defining an annular space between the housing and the tube and containing the resistance element and the sleeve, a strong adhesive material filing the said space, and electrical leads from the resistance element passing to the exterior through openings in the housing.

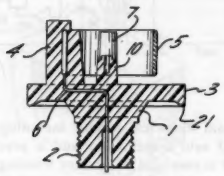
3,937,088
DRIVE MECHANISM FOR PRESSURE-GAGES, COMPRISING A MOLDED PLASTICS MAIN BODY WITH EMBEDDED BOURDON TUBE

Giuseppe Stradella, and Umberto Stradella, both of 13 Via Roma, Recco (Genoa), Italy

Filed Feb. 21, 1974, Ser. No. 444,484
Claims priority, application Italy, Feb. 27, 1973, 12479/73; July 13, 1973, 12734/73; July 17, 1973, 12737/73
Int. Cl.² G01L 7/04
U.S. Cl. 73—418 9 Claims

1. A drive mechanism for pressure-gages, which comprises a support main body; a Bourdon tubular spring having a movable end and a fixed end embedded in said main body, and a

small tube embedded in said main body connected at one end to said Bourdon tubular spring; said main body being formed, in a single molding operation, with an integral circular platform, at least one upright support projecting from said platform, and a depending axial stem for connection to a source



of pressure, said stem having an axial conduit therein providing communication between the other end of said small tube and said source of pressure, said fixed end of said Bourdon tubular spring being embedded in a first said upright support and said small tube being embedded in said main body during said molding operation.

3,937,089

SCREW DRIVE

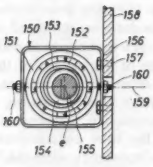
Robert Gärtner, Freiherr vom Stein Str. 8, 6038 Butzsbach, Hessen, Germany

Filed Dec. 18, 1973, Ser. No. 425,924

Claims priority, application Germany, Dec. 19, 1972, 2262062

Int. Cl.² F16H *21/16*

U.S. Cl. 74—25 **10 Claims**



1. A screw drive which includes in combination: a threaded spindle having threads and a spindle axis, frame means extending around said threaded spindle, anti-friction bearing means extending around said threaded spindle and interposed between said frame means and said threaded spindle, said anti-friction bearing means comprising an inner ring having an axis and meshing with said threaded spindle and having a central axis inclined and eccentrically arranged relative to the longitudinal axis of said threaded spindle, said anti-friction bearing means also having an outer ring pivotally supported by said frame means for avoiding binding by pivoting about a rigid pivot axis extending in the direction of the eccentricity of the axis of said inner ring with regard to said spindle axis thereby to utilize said threaded spindle for pivoting said outer ring about said rigid axis and avoiding binding as a consequence thereof and making possible lifting of greater loads.

3,937,090

MEASURING INSTRUMENT

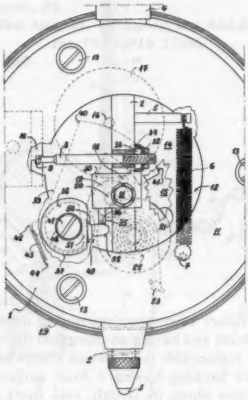
Jean-Claude Risse, Prangins, and Bruno Hardegger, Monaltorf, both of Switzerland, assignors to Tesa S.A., Renens, Switzerland

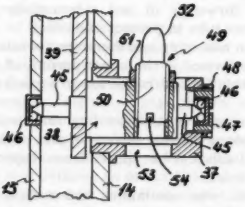
Filed May 15, 1974, Ser. No. 470,067

Claims priority, application Switzerland, June 13, 1973, 8518/73

Int. Cl.² F16H *25/08*

U.S. Cl. 74—55 **4 Claims**





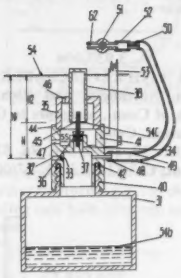
1. A measuring instrument in which the rectilinear displacement of a feeler rod is transmitted to a geared multiplier mechanism by means of a rotating element such as an arm carrying a toothed sector meshing with a first toothed wheel of the multiplier mechanism, the transmission of movement between the feeler rod and the rotating element being effected by an abutment carried by the feeler rod and in contact with the profile of a cam carried by the element the cam profile being an involute of the circle, said cam having a base which can slide in a support coaxial with said rotating element and fixed to it, and wherein the abutment comprises a bearing surface always perpendicular to the axis of the feeler rod this abutment being held against a cam of revolution the longitudinal profile of which is an involute of the circle and the longitudinaal axis of which is perpendicular to the axis of rotation of the rotating element, the cam of revolution being axially movable, so that the angle of engagement between the cam and the abutment surface is always equal to zero for all axial positions of the cam.

3,937,091

APPARATUS FOR SAMPLING A LIQUID

Richard W. Jones, 56 Trent Lane, Kings Newton, Derbyshire, England

Filed July 26, 1972, Ser. No. 275,403
Int. Cl.[2] G01N *01/14*
U.S. Cl. 73—425.4 R 1 Claim



1. Apparatus for sampling a liquid comprising:

a container for immersion in the liquid to a selected depth, the container including a closure means having a liquid intake means comprised of an elongated horizontal bore opening into the upper portion of the container through said closure means, said bore having a diameter at the point where it opens into said container of a size whereby a meniscus is formed by the surface tension of the liquid thereby preventing gas from exiting the container through said liquid inlet means when said meniscus is formed;

a gas exit passage means for selectively providing restricted flow of gas from the top of said container; and

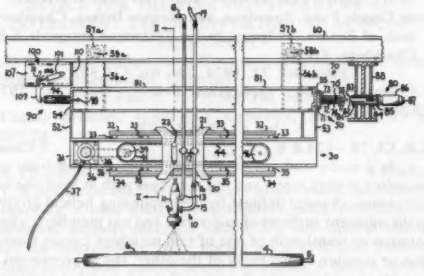
an elongated adjustable venting tube surrounding a vertical capillary tube in the closure means in communication with said bore opening for controlling the liquid flow rate into the container.

3,937,092

RECIPROCATING DEVICE HAVING VIBRATION REDUCING MEANS

Charles T. Hawkins, Verona, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 229,385, Feb. 25, 1972, Pat. No. 3,796,184. This application Nov. 1, 1973, Ser. No. 411,952
Int. Cl.[2] F16H *21/02*
U.S. Cl. 74—27 7 Claims



1. An apparatus for reciprocating a movable device along a given axis of reciprocation, comprising:

a movable device;

means connected to said movable device for imparting accelerating and decelerating forces to said device and a reciprocating motion to said device along the given axis of reciprocation;

carriage means;

means for mounting said carriage means for movement along a path substantially parallel to the given axis of reciprocation;

means operatively connected to said carriage means and to said reciprocating motion imparting means for transferring substantially all of the accelerating and decelerating forces associated with the reciprocation of said movable device to said carriage means to oscillate said carriage means along the path substantially parallel to the given axis of reciprocation of said movable device and substantially opposite to the motion of said device; and

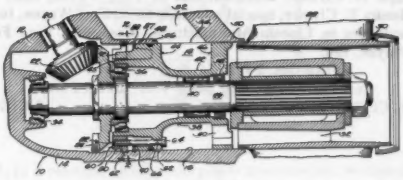
shock absorbing means for countering the motion of said carriage means produced by the accelerating and decelerating forces associated with the reciprocation of said movable device.

3,937,093

MARINE PROPULSION DEVICE WITH ANCHORING MEANS FOR PROPELLER SHAFT BEARING CARRIER

Ronald G. Johnson, Kenosha, Wis., and Gerald E. Kashmerick, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Sept. 5, 1974, Ser. No. 503,344
Int. Cl.[2] F16H *1/14*; B63H *5/13*
U.S. Cl. 74—417 12 Claims



1. A lower unit for a marine propulsion device comprising a drive shaft housing having a lower end, a gearcase housing connected to said lower end of said drive shaft housing and having an interior wall defining an elongated cavity, a propeller shaft located in and extending axially through said gearcase housing cavity, means for rotatably supporting said propeller shaft inside said gearcase housing including a hollow bearing carrier member which is in encircling relation with said propeller shaft, is supported from said interior wall of said gearcase housing, and carries a bearing rotatably engaging said propeller shaft, and means for anchoring said bearing carrier member to said interior wall of said gearcase housing including an annular, internal groove in said gearcase housing, a resilient, annular anchoring element which is located in said groove and which is capable of being compressed in the plane of said anchoring element for insertion into said groove and thereafter expanded to thereby retain said anchoring element in said groove and against axial displacement relative to said gearcase housing, and means for fastening said bearing carrier member to said anchoring element when the anchoring element is in said groove.

3,937,094

TOOTHED BELT

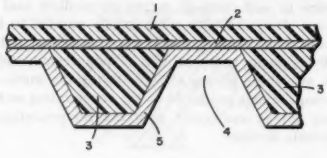
Mario Cicognani, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jan. 2, 1974, Ser. No. 429,812

Claims priority, application Italy, Dec. 29, 1972, 33879/72; Jan. 26, 1973, 19643/73

Int. Cl.² F16G 1/28

U.S. Cl. 74—231 C 8 Claims



1. A toothed belt comprising an elastomeric or plastic continuous band, a reinforcing structure embedded in said band, a toothing on at least one face of the band and a covering for the toothing, characterized in that said covering is constituted by at least two layers of fabric doubled together with a layer of elastomeric or plastic material interposed therebetween, whereby said covering is an extremely rigid layer which is substantially non-deformable by flexion stresses in comparison with the elastomeric or plastic material forming the toothing.

3,937,095

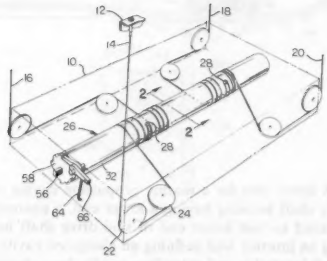
SELF ADJUSTING ELEVATOR

Joseph D. Clymer, deceased, late of Fort Wayne, Ind., by Bonita E. Clymer, special administratrix, Fort Wayne, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Oct. 24, 1974, Ser. No. 517,505

Int. Cl.² F16H 7/00; B66B 9/00; B65D 25/10

U.S. Cl. 74—224 5 Claims



1. A weight responsive elevator frame for a storage cabinet having a vertical recess in which the frame is horizontally disposed, the frame being moveable upwardly in the recess as the weight thereon is reduced and vice versa, the frame having a cable extending substantially vertically upwardly from near each corner thereof and each connected at the upper end to a stationary anchor point in the cabinet near the upper end of the recess, a wind up cylinder carried by the frame and about which cylinder the cables are entrained in one and the same circumferential direction and to which the other ends of the cables are connected, a shaft in the frame on which the cylinder is rotatably supported, a torsion spring in the cylinder having one end connected to the shaft and the other end connected to the cylinder, the shaft having means on at least one end engageable from outside the frame for adjusting the angular position of the shaft in the frame, a ratchet wheel on the shaft, pawl means on the frame engaging said ratchet wheel to hold the shaft against the bias of the biasing spring, means biasing said pawl means toward operative engagement with said ratchet wheel, a lever element fixed to said pawl means for selectively disengaging said pawl means from said ratchet wheel, and means for connecting said lever element to the frame when the pawl means is in shaft holding engagement with said ratchet wheel.

3,937,096

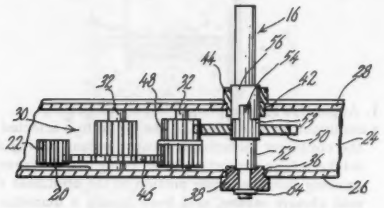
MOTOR SYSTEM WITH REPLACEABLE OUTPUT SHAFT

Robert S. Lundin, Northfield, and Richard K. Keutzer, Thomaston, both of Conn., assignors to General Time Corporation, Thomaston, Conn.

Filed Dec. 30, 1974, Ser. No. 537,552

Int. Cl.² F16H 1/12, 57/00

U.S. Cl. 74—421 A 13 Claims



1. In combination:
a. a prime mover including
1. an output pinion,
b. means for connecting a source of power to said prime mover for driving said output pinion;
c. a drive train including at least
1. an output gear and
2. an input gear, said input drive train gear connected to said output pinion to be driven by said output pinion;
d. an output shaft including
1. an elongated shank and
2. means within one end region of said shank adapted to cooperate with complementary means on a member to drive said member by said output shaft; and
e. connector means for releasably supporting said output shaft and coupling said output shaft to said output drive train gear.

3,937,097

BALL-EQUIPPED SCREW AND NUT MECHANISMS

Jean Claude Fund, Bourdeau, and Jacques Detraz, Chambery, both of France, assignors to La Technique Integrale S.A., Chambery, France

Filed Oct. 21, 1974, Ser. No. 516,502

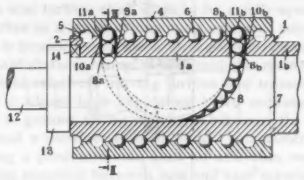
Claims priority, application France, Oct. 30, 1973, 73.38614

Int. Cl.² F16H 4/18

U.S. Cl. 74—424.8 R 7 Claims

1. In a screw and nut mechanism equipped with balls and including mating screw and nut members with at least one ball circulation channel defined by corresponding helical grooves in the adjacent surfaces of said screw and nut members, where rotation or translation of one of said members causes translation or rotation respectively of the other, the improvement in combination therewith wherein said screw member comprises a tubular cylinder with an axial bore defined through the cylinder wall and two axially spaced-apart holes extending radially through said wall, the mechanism further comprising within said bore a cylindrical core having an outer surface corresponding to said bore and having defined in said surface at least one helical recirculation channel with an axial length

less than that of the nut and the core and a width slightly greater than the diameter of said balls, the recirculation channel having its ends in communication via said radial holes with the bottom of at least one of said helical grooves of the screw, said mechanism further comprising guide means adjacent said radial holes for guiding said balls between said circulation and recirculation channels.



3,937,098

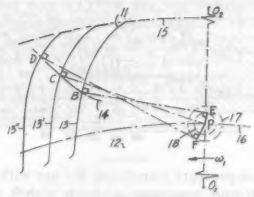
HIGH TORQUE GEARING

William S. Rouverol, P.O. Box 9122, Berkeley, Calif. 94709

Continuation-in-part of Ser. No. 524,419, Nov. 18, 1974, abandoned. This application Dec. 4, 1974, Ser. No. 529,298

Int. Cl.² F16H *55/06*

U.S. Cl. 74—462 **15 Claims**



1. In a pair of toothed gears,

mating teeth formed to have active profiles perpendicular to the pitch line of said pair which have at least one culmination point substantially removed from said pitch line,

said profiles of at least one of said pair having a portion with curvature that increases with distance from the pitch surface ~~of~~ said one of said pair.

3,937,099

DEVICE FOR THE FINE ADJUSTMENT OF AN INSTRUMENT TABLE SUPPORTING AN OPTICAL EQUIPMENT

Kurt Koehler, Koenigsbronn, Germany, assignor to Carl Zeiss-Stiftung, Oberkochen, Germany

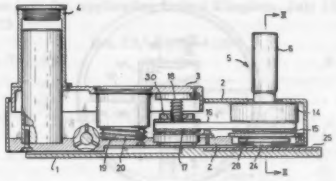
Filed Feb. 7, 1975, Ser. No. 547,807

Claims priority, application Germany, Mar. 19, 1975, 2407174

Int. Cl.² G05G *9/00*

U.S. Cl. 74—471 XY **4 Claims**

1. A device for the fine adjustment of an optical instrument, comprising a base plate, an instrument table including an instrument support plate for supporting said optical instrument, an intermediate plate resting upon said base plate, a control lever, said control lever comprising a hollow sleeve and a rod extending into said sleeve and engaging said sleeve without lost motion, said sleeve being rotatable about its longitudinal axis, a universal joint mounted on the lower end of said sleeve on which said control lever swivels in all directions about a pivot point defined by said universal joint, a gearwheel mounted on said universal joint and rotatable with said sleeve and universal joint, and means connected with said gearwheel and operable on rotation of said sleeve to raise and lower said instrument support plate, said rod being pivotally connected to said intermediate plate at its lower end and being pivotally connected to said instrument table at a point below said pivot point of said universal joint to produce horizontal displacement of said instrument table when said control lever is swivelled.



3,937,100

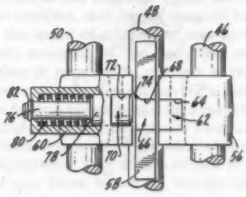
TRANSMISSION SHIFT CONTROL

Dale F. Huffman, Muncie, and Charles E. Zeh, Chesterfield, both of Ind., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 15, 1974, Ser. No. 497,815

Int. Cl.² G05G *5/02, 9/14*

U.S. Cl. 74—476 **6 Claims**



1. In a multiple speed ratio power transmission mechanism having gear elements selectively engagable for defining torque delivery paths between a driving member and a driven member, shift elements movable for selectively engaging said gear elements, and a shift member movable for selectively engaging and moving said shift elements, the improvement wherein said shift member is movable in a first plane into at least one engaging position and in a second plane into another engaging position, said shift elements defining gates, one of said shift elements defining a gate offset from the remainder thereof, said one shift element blocking movement of said shift member in said first plane into its gate and allowing movement of said shift member in said second plane into its gate to establish said other engaging position, another of said shift elements defining a gate having a portion thereof enlarged adjacent said offset gate, thereby facilitating movement of said shift member between said planes.

3,937,101

STEERING WHEEL WITH PAD CONTAINER

Henry M. Wade, 33040 Roberts St., Elsinore, Calif. 92330

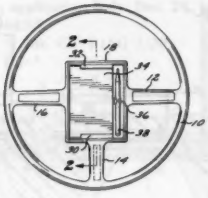
Filed May 28, 1974, Ser. No. 473,371

Int. Cl.² B62D *1/04, 1/08*

U.S. Cl. 74—552 **7 Claims**

1. A steering wheel adapted to be mounted on a steering post including an outer ring, an inner hub, elements interconnecting said outer ring and said hub substantially centrally within said outer ring wherein the upper portion of said hub is formed as a recessed receptacle adapted to receive a mating

writing pad container, said container engaged with and releasably mounted in said receptacle by means of resiliently movable tabs locking in mating grooves and a writing pad carried in said container.



3,937,102

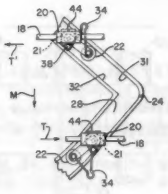
NOISE SUPPRESSION

Clayton H. Allen, 651 Concord Ave., Cambridge, Mass. 02138

Filed July 22, 1974, Ser. No. 490,311

Int. Cl.[2] F16H *53/06*

U.S. Cl. 74—569 10 Claims



1. In a cam and cam follower assembly employing a cam surface having opposing first and second walls that guide a reciprocating cam follower means having a leading portion, the improvement comprising,

means for establishing one of said walls as a leading wall in contact with said leading portion for most of the path followed by said cam follower means during a traversal of said path and the other as a trailing wall normally free from contact with said leading portion for shifting the cam follower means leading portion from the then leading and next trailing wall to the then trailing and next leading wall prior to the reciprocating motion reversal.

3,937,103

FLYWHEEL ARRANGEMENT FOR AN ELECTRICAL MACHINE

Siegfried Kleinhans, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

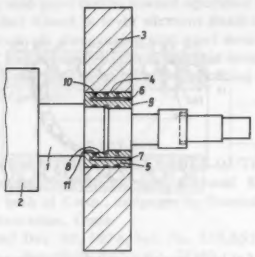
Filed Jan. 28, 1974, Ser. No. 437,226

Claims priority, application Germany, Feb. 9, 1973, 2306915

Int. Cl. F16c *15/00*

U.S. Cl. 74—572 12 Claims

1. A flywheel arrangement for an electrical machine having a shaft comprising: an annular solid flywheel devoid of any cavities therein; a flange-like structure on the shaft for defining a seating surface to accommodate said flywheel; said flywheel tightly engaging said seating surface thereby causing undesired stress peaks to develop in said flywheel; and, passage means formed in said structure for directing oil under pressure directly to said seating surface for expanding said flywheel to remove said stress peaks and, if required, for facilitating the subsequent removal of said flywheel from said seating surface.



3,937,104

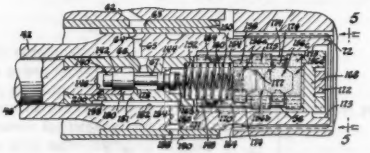
POWER TRAIN INCLUDING A TORQUE-PRESSURE TRANSDUCER

Jack H. Van Gorder, Chelsea, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 11, 1974, Ser. No. 487,775

Int. Cl.[2] F16H *47/00*; F16D *23/00*, *33/00*; F16K *31/44*

U.S. Cl. 74—732 4 Claims



1. A torque-pressure transducer for use with a power train including a torque converter, a clutch, a shift valve, a source of fluid under pressure, a mainshaft, and a hollow turbine shaft operatively connected between said torque converter and said clutch for driving said mainshaft when said clutch is engaged, said torque-pressure transducer comprising a transducer shaft mounted in said hollow turbine shaft and fixedly secured to one end thereof, a chamber formed in the free end of said transducer shaft, an inlet into said chamber for said fluid under pressure, a plurality of axially aligned cam members having alternate cooperating, oppositely contoured cam surfaces formed thereon, each cam member being operatively connected to said transducer shaft and alternate cam members being operatively connected to said turbine shaft so as to be axially spreadable to a variable overall length in said chamber in response to sliding action between adjacent cam surfaces in proportion to the relative torque-responsive twist between said shafts, spring-biased regulating valve means mounted in said chamber and responsive movement of said axially spreadable cam members for regulating said fluid under pressure, and conduitry means communicating said regulated fluid from said regulating valve means to said shift valve.

4. A torque-pressure transducer for use with a power train including a torque converter, a clutch, a shift valve, a source of fluid under pressure, a mainshaft, and a hollow turbine shaft operatively connected between said torque converter and said clutch for driving said mainshaft when said clutch is engaged, said torque-pressure transducer comprising a transducer shaft mounted in said hollow turbine shaft and fixedly secured to one end thereof, a chamber formed in the free end of said transducer shaft, a passage for communicating said fluid under pressure from said source to said chamber, a pair of oppositely disposed openings formed in the wall of said transducer shaft, a pair of wider oppositely disposed openings formed in the wall of said turbine shaft, a plurality of axially aligned cam

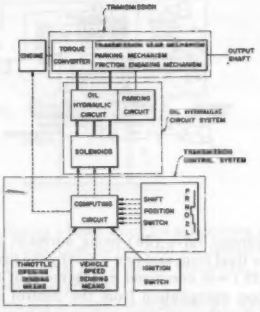
members with adjacent cam member mounted in an abutting, camming relationship in said chamber, each having oppositely disposed tabs formed thereon and extending into said openings formed in said transducer shaft, with said tabs on alternate cam members extending additionally into said openings formed in said turbine shaft so as to be axially spreadable in said chamber as a result of camming action of adjacent cam members in proportion to the relative torque-responsive twist between said shafts as transmitted to said cam members by the edges of said relatively moving turbine and transducer shaft openings, a closed-loop regulating valve mounted in said chamber, a ground spring mounted between the end cam member and a shoulder formed in said transducer shaft for maintaining a predetermined load on said cam members, a valve spring mounted between said end cam member and an end of said closed-loop regulating valve, said regulating valve being responsive through said valve spring to movement of said axially spreadable cam members for regulating said fluid under pressure, an external closed-loop modulator valve, first conduitry means communicating regulated fluid from said regulating valve to said modulator valve, and second conduitry means communicating modulated fluid from said modulator valve to said shift valve.

3,937,105

AUTOMATIC TRANSMISSION SYSTEM FOR USE WITH AUTOMOBILES

Hiroshi Arai, and Yutaka Taga, both of Toyota, Japan, assignors to Toyoto Jidosha Kogyo Kabushiki Kaisha, Japan

Filed Aug. 8, 1974, Ser. No. 495,915
Claims priority, application Japan, Aug. 29, 1973, 48-96931
Int. Cl. B60k *21/00*; F16h *3/74*
U.S. Cl. 74—846 **5 Claims**



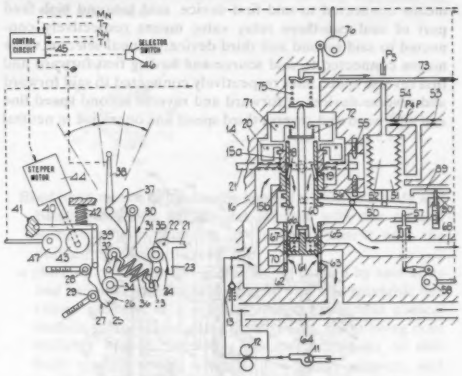
1. An automatic transmission system for use with automobiles comprising a gear wheel transmission mechanism, a plurality of hydraulically operable engaging means to accomplish transmission meshings in said gear wheel transmission mechanism, a parking mechanism, a hydraulically operable parking actuating means to actuate said parking mechanism, hydraulic pressure shift valve means operated by a plurality of solenoids to control the supply of hydraulic pressure to said engaging means and said parking actuating means, electric switches to be manually operated, means to generate signals regarding the vehicle running condition, and a computing circuit to control energization of said solenoids of said hydraulic pressure shift valve means in response to electric signals despatched from said electric switches and said signal generating means.

3,937,106

SPEED RESPONSIVE GOVERNOR ARRANGEMENTS

Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Aerospace Limited, Birmingham, England

Filed July 18, 1974, Ser. No. 489,576
Claims priority, application United Kingdom, July 18, 1973, 34133/73
Int. Cl.² B60K *41/04*
U.S. Cl. 74—857 **9 Claims**



1. A speed responsive governor arrangement, comprising a body, a governor device rotatable within the body and including an output member, said output member being movable in response to the speed of rotation of said governor device, a lever pivotally mounted on the body and movable by said output member in response to changes in the speed of said governor device, a cam element having a pair of oppositely-directed cam faces, a plurality of rollers mounted on said body and supportingly engaging one of said cam faces, a transmission device including a pair of bearing elements biased into respective engagement with an arm of said lever and with the other of said cam faces, means for moving said transmission device so as simultaneously to vary the points of engagement of said bearing elements with said lever arm and said other cam surface, and means for moving said cam element so that said one cam face moves over all of said rollers simultaneously.

3,937,107

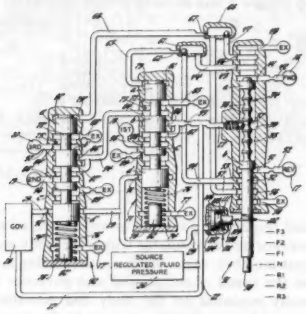
DOWNSHIFT INHIBITOR FOR A POWERSHIFT TRANSMISSION

Carl A. Lentz, Mooresville, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 23, 1974, Ser. No. 535,347
Int. Cl.² B60K *41/04*
U.S. Cl. 74—861 **4 Claims**

1. In a transmission; an input; an output; a forward and reverse gear unit driven by said input and having a forward and a reverse drive fluid operated device for selectively establishing forward and reverse drive and a three speed gear unit having first, second and third speed drive fluid operated devices for selectively establishing first, second and third speed drive connected in series to provide first, second and third speed drive to said output in either forward or reverse; a source of fluid pressure; governor means driven by said output providing a governor pressure proportional to speed of said output; a one-two and a two-three shift relay valve means each having biasing means, a valve element normally biased by said biasing means to a downshift position and signal responsive actuator means operative to upshift said valve element to upshift position and downshift inhibitor means connected to said governor means and responsive to governor pressure only in said upshift position to prevent a downshift by said biasing means above a predetermined speed and a high exhaust port, a high feed port, supply port means, a low feed port and a low

exhaust port operative in downshift position to connect said supply port means to said low feed port and said high feed port to said high exhaust and in upshift position to connect said supply port means to said high feed port and said low feed port to said low exhaust port; said supply port means of said one-two relay valve means connected to said source; a two-three feed line connecting said high feed port of said one-two relay valve means to said supply port means of said two-three relay valve means; said low feed port of said one-two relay valve means connected to said first device, said low and high feed port of said two-three relay valve means respectively connected to said second and third device; manual selector valve means connected to said source and having first forward and first reverse speed lines respectively connected to said forward and reverse devices, a forward and reverse second speed line and a forward and reverse third speed line operative in neutral



position to block said source and connect all said speed lines to exhaust and operative in first, second and third speed forward positions to respectively connect said source to said first forward speed line, to said first and second forward speed lines and said first, second and third forward speed lines and in first, second and third speed reverse positions to connect said source respectively to said first reverse speed line, to said first and second reverse speed lines and to said first and second and third speed reverse lines; a second speed shuttle valve connecting the one of said second forward speed line or second reverse speed line under pressure to said actuator means of said one-two relay valve means and blocking the other and a third speed shuttle valve connecting the one of said third forward speed line and third reverse speed line under pressure to said actuator means of said two-three relay valve means and blocking the other.

3,937,108

ELECTRONIC AND HYDRAULIC CONTROL SYSTEM FOR AUTOMOTIVE, AUTOMATIC GEAR CHANGE TRANSMISSIONS

Gerhard Will, Beutelsbach, Germany, assignor to Robert Bosch G.m.b.H., Gerlingen-Schillerhohe, Germany

Filed Oct. 21, 1974, Ser. No. 516,662

Claims priority, application Germany, Oct. 23, 1973, 2352939

Int. Cl.[2] B60K *41/18*

U.S. Cl. 74—866 **10 Claims**

1. Hydraulic control system for an automotive automatic gear change transmission having three forward gear ranges (1, 2, 3) and a reverse (R) range, and a system of clutch (46, 53) and brake (39, 44, 49) means to control selective engagement of the gears of the transmission comprising

a pressure pump (11) and a pressure regulator means (14) to supply pressurized hydraulic fluid under predetermined pressure to operate the clutch and brake means;

a manual selector means (15') and a selector valve (15) controlled thereby to command a predetermined gear range position;

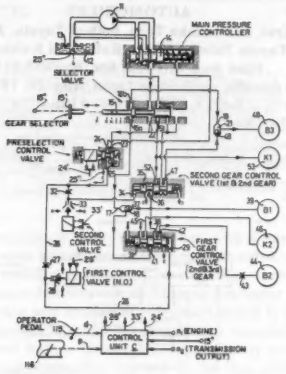
a control unit (C) having input signals applied thereto representative of engine and vehicle operating parameters and providing output signals to select the proper gears for operation of the vehicle as determined by said engine vehicle operation parameters;

a first gear control valve (31) having first and second inputs (29, 41) controlling engagement of the respective clutch and brake means of the second and third gear ranges and normally in a position to connect hydraulic pressure fluid to the respective clutch and brake means commanding the transmission to be in third gear;

a second gear control valve (35) controlling engagement of the respective clutch and brake means of the first and second gear range;

a pressure line (26, 26*a*) in fluid communication with said pump (11) and pressure regulator (14) and including a hydraulic choke (27);

a first control valve (28) connected to and controlled by said control unit (C) and hydraulically connected in said pressure line (26) between the choke (27) and the first input (29) of the first gear control valve (31);



the first control valve (28) being normally open to bleed pressure fluid from said line whereby the first gear control valve (31) will command engagement of the third gear and, upon energization from the control unit (C) upon sensing that the operation parameters require the second gear, said first control valve (28) being energized to thereby prevent bleeding of pressurized fluid and cause change-over of said first gear control valve (31);

said system being characterized by

a three-way check valve (18) having a first input (17) connected to an output (16) of the selector valve (15) and a second input (37) connected to an output (36) of the second gear control valve (35) and having its output connected to the second control input (41) of the first gear control valve (31), said check valve thereby providing pressure through its output to the first gear control valve (31) under control of the second gear control valve (37) for operation under normal operating conditions and additionally providing output to the first gear control valve (31) and manual selection of the selector means (15') operating said selector valve (15) even if said control unit (C) is disabled and does not provide operating signals to said control valve (28).

3,937,109
METHOD OF MANUFACTURING CUTTING AND/OR CREASING DIE

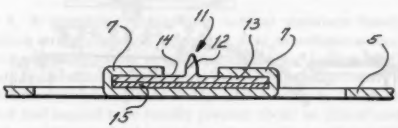
Siegfried Korner; Wolfgang Meurer; Harald Knofel; Dieter Prochazka, and Rudi Hirche, all of Dresden, Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Dec. 18, 1974, Ser. No. 534,350

Claims priority, application Germany, Jan. 2, 1974, 2617576

Int. Cl.² B21K 5/20

U.S. Cl. 76—107 C 5 Claims



1. A method of manufacturing a die, comprising the steps of providing a planar sheet with a plurality of tongues extending substantially normal to a major surface of said sheet; positioning a plurality of blades between respective ones of said tongues so that central projections thereof extend normal to said major surface; and bending said tongues around other portions of said blades so as to attach said blades to said sheet.

3,937,110
LATHE FOR MACHINING HOLLOW PARTS

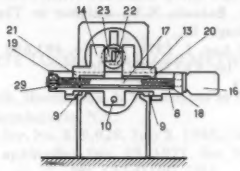
Pierre E. Renoux, Colombes, France, assignor to CRI-DAN, Paris, France

Filed Apr. 1, 1075, Ser. No. 563,957

Claims priority, application France, Apr. 8, 1974, 74.12281

Int. Cl.² B23B 21/00, 5/30

U.S. Cl. 82—25 3 Claims



1. In a lathe having a head-stock for supporting a work piece on a rotational axis concentric with an interior surface of revolution in the work piece to be machined, cutting tool supporting means comprising:

a pair of carriages arranged symmetrically with respect to the rotational axis and movable longitudinally and transversely in parallel with a common plane passing through said axis, at least one tool holder bar supported by each of said carriages and projecting generally parallel to said rotational axis, the cross-sectional configuration of at least one of said tool holder bars defining a surface parallel to said common plane for supporting the other of said tool holder bars.

3,937,111
ADJUSTABLE LIVE CENTER ADAPTER

Raymond L. Holloway, 15624 South Brentwood, Channelview, Tex. 77530

Filed Oct. 24, 1974, Ser. No. 517,493

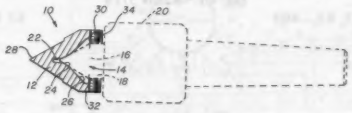
Int. Cl.² B23B 23/02, 23/04

U.S. Cl. 82—33 A 10 Claims

1. A center adjustment adapter for rendering a live center for machines adjustable for controlled positioning of work pieces relative to the work rotating axis of such machines, said adapter comprising:

a body having a generally conical recess formed therein, said recess being adapted to receive the conical extremity of a rotatable live center element in non-rotatable relation therein;

conical surface means being formed on the exterior of said body and being located for receiving contact within the center hole of a work piece to be rotatably supported by such machines;



fixed pivot means being fixedly located within said body and being positioned for pivotal contact with the conical surface of said rotatable live center element near the pointed extremity thereof; and

a plurality of adjustment screws being carried by said body and being located for engagement with said rotatable live center element at a position remote from said conical surface thereof, said adjustment screws, upon being controllably moved, imparting pivotal movement to said body relative to said rotatable live center element, said pivotal movement being about said fixed pivot means.

3,937,112
WEB FEEDING APPARATUS

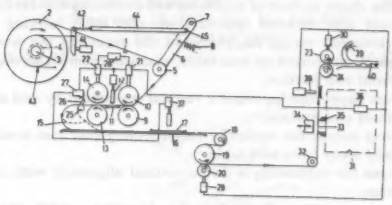
Robert Ernest Geeson, Pinner, England, assignor to Metal Box Limited, Reading, England

Filed July 26, 1974, Ser. No. 492,232

Claims priority, application United Kingdom, Aug. 8, 1973, 37642/73

Int. Cl.² B26D 5/00

U.S. Cl. 83—57 11 Claims



1. Web feeding apparatus comprising a first feed roll, a second feed roll downstream of the first feed roll, said first and second feed rolls each being rotatable at a predetermined constant peripheral velocity, said first and second feed roll velocities being different, a third feed roll downstream of the second feed roll, a fourth feed roll downstream of the third feed roll, said third and fourth feed rolls being synchronously intermittently rotated with accurate angular displacements of predetermined extent followed by simultaneous periods of dwell of predetermined duration, first, second, third and fourth pressure rolls cooperative with said first, second, third and fourth feed rolls, and pressure roll positioning cooperable with each pressure roll and selectively operable to individually move the pressure rolls into and out of cooperative relation with the respective feed rolls, the arrangement being such that during normal web feeding operation of the apparatus one or other of the first and second pressure rolls co-operates with its respective feed roll to feed into a loop between the second and third feed rolls a portion of web the length of which approximates to that of the length of web fed by the third and fourth

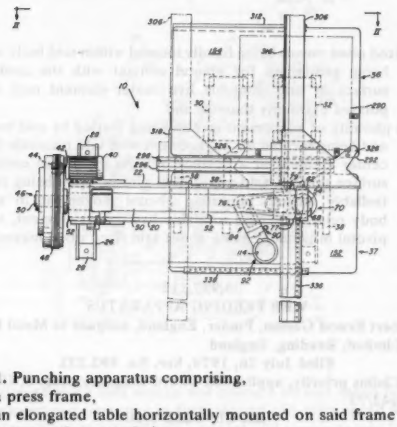
feed rolls in co-operation with their respective pressure rolls during one period of angular displacement of the third and fourth feed rolls.

3,937,113

PUNCHING APPARATUS

James J. Pancook, Tonawanda, and Ralph L. Weisbeck, Williamsville, both of N.Y., assignors to Unipunch Products, Inc., Buffalo, N.Y.

Filed Mar. 5, 1974, Ser. No. 448,334
Int. Cl.[2] B26D 5/16
U.S. Cl. 83—400 41 Claims



1. Punching apparatus comprising,

a press frame,

an elongated table horizontally mounted on said frame for supporting a workpiece,

said press frame having an arm member positioned above the upper surface of said table and extending thereacross, said arm member spaced from said table forming an elongated recess therebetween for receiving the workpiece supported on said table, said arm member having a front end portion,

a ram supported for relative vertical movement by said arm front end portion,

power means for vertically reciprocating said ram toward and away from said table,

means for supporting a die in vertical alignment with said ram,

a tool support arm having a rear end portion and a front end portion,

a tool holder secured to said tool support arm front end portion,

connecting means for pivotally connecting said tool support arm rear end portion to said press frame arm member rearwardly of said press frame arm member front end portion between said press frame arm member and said table,

said tool support arm and said tool holder laterally movable in a horizontal plane relative to said press frame arm member from a first position vertically aligned with said ram and said die supporting means to a second position displaced laterally from said ram and said frame arm member front end portion to permit replacement of said tool holder and tools in said tool holder,

means for interchangeably locking said tool holder to said tool support arm,

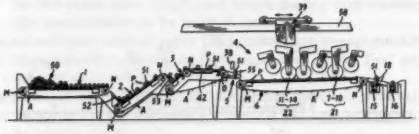
fluid actuated means for rigidly engaging said tool support arm and said tool holder to said press frame arm member and disengaging said tool support arm and said tool holder from said press frame arm member.

3,937,114

APPARATUS FOR CUTTING LOGS

Karl-Erik Joensson, Pierre Fond, Canada, Hakan, Nordquist, Decatur, Ga., assignors to Mo och Domsjo Aktiebolag, Ornskoldsvik, Sweden

Filed Nov. 19, 1974, Ser. No. 525,127
Claims priority, application Sweden, Nov. 22, 1973, 7315844
Int. Cl.[2] B27B 5/04
U.S. Cl. 83—425.2 12 Claims



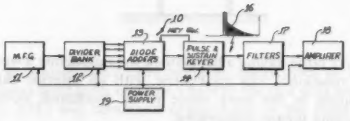
1. An apparatus for cutting lengths of trees or logs into shorter pieces, comprising in combination, a conveyor for carrying lengths of trees or logs sideways to and through a cutter; a cutter extending across the conveyor and comprising a plurality of cutting means movable between inactive noncutting and active cutting positions and between limiting positions along the length of a tree or log for cross-cutting the length at a selected position, the cutting means being arranged in groups, and spaced lengthwise in such groups along the length of the conveyor a distance such that only one cutting means in a group is in cutting engagement with a given length of tree or log at one time; means for arranging selected cutting means across the conveyor according to the selected cuts to be made in a length of tree or log; and means for collecting and delivering cut log pieces according to the desired end use.

3,937,115

ELECTRONIC PIANO CIRCUIT ARRANGEMENT

James G. Staley, Batavia, N.Y., assignor to The Wurlitzer Company, Chicago, Ill.

Filed Aug. 1, 1974, Ser. No. 493,690
Int. Cl.[2] G01H 1/06, 5/02
U.S. Cl. 84—1.23 7 Claims



1. In an electronic piano circuit the combination comprising: multifrequency generator means for providing the fundamental and harmonic frequencies for each of the notes of a piano keyboard, a matrix array having a first group of lines to receive each of the fundamental and harmonic frequencies of the notes and said piano keyboard, said matrix array having a second group of lines, key switch means associated with a piano keyboard and coupled to said second group of lines, said second group of lines including means to transfer said fundamental frequency and a predetermined number of harmonic frequencies by the actuation of a single key switch of said key switch means, and resistor-diode coupling means between selected ones of said first and second groups of lines, the resistance value of each of said resistor-diode coupling means being selected to transfer different amplitude values of said fundamental and harmonic frequencies, whereby combining of the different values of the fundamental and harmonic frequencies will produce an apparent authentic piano sound.

3,937,116

TENOR TROMBONE CONSTRUCTION

Lawrence Ramirez, Kenosha, Wis., assignor to G. Leblanc Corporation, Kenosha, Wis.

Filed Oct. 21, 1974, Ser. No. 516,530
Int. Cl.² G10D 7/10
U.S. Cl. 84—395 4 Claims

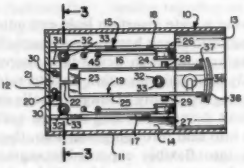
1. A trombone comprising; tubular members having an initial straight portion beginning at a mouthpiece receiving end and terminating in a sound-emanating bell portion, said tubular member including first and second spaced apart tubes, said first tube being held in a pivotal relation to the trombone and said second tube readily pivoted about an axis of said first tube, said second tube having a terminating end extending in a direction opposite that of said mouthpiece receiving end portion and in axial alignment therewith, a slide member having a U-shaped end portion leading into a pair of straight parallel spaced apart portions having open ends telescoping with the terminating ends of said pair of spaced apart tube members to slide therealong for the playing of different musical notes, a plurality of uniformly spaced apart, parallel piston valves positioned in direct communication with said tubular members adjacent said mouthpiece receiving end portion to be manipulated for the playing of different musical notes which can be the same as or different than the musical notes produced by said slide member, and including post means secured to one of said plurality of uniformly spaced apart parallel piston valves and extending in a direction of said mouthpiece receiving end portion, holding means secured to said post and adapted to engage said mouthpiece receiving end portion for holding the same to prevent pivotal movement of said second tube member about the longitudinal axis of said first tube member.

3,937,117

COMPOSITE TUNING FORK AND METHOD OF MAKING SAME

Boris F. Grib, Huntington, N.Y., assignor to Philamon Incorporated, Farmingdale, N.Y.

Division of Ser. No. 839,928, July 8, 1969, Pat. No. 3,632,192.
This application Dec. 29, 1971, Ser. No. 213,662
Int. Cl.² G10G 7/02
U.S. Cl. 84—454 10 Claims



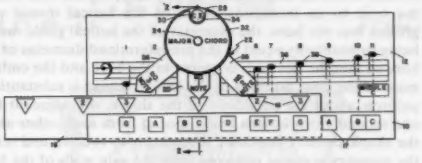
1. A method of forming the tines and tine junction portion of a tuning fork structure, comprising the steps of forming a unitary member of generally L-shaped cross section in one plane with a relatively thick part and a relatively thin sheet-like part, separating similar portions of said elongated member bounded by equally spaced planes parallel to said one plane, each said portion comprising one of said tines and a tine-junction portion, and securing a pair of said similar portions in relatively immovable symmetrical relationship at the relatively thick parts thereof to form a rigid tine junction portion of said thick parts with said thin parts forming precisely similar tuning fork tines.

3,937,118

INVERSION SLIDERULE

Verna M. Leonard, 8701 Highway 41, Fresno, Calif.

Filed Apr. 17, 1975, Ser. No. 568,995
Int. Cl.² G09B 15/02
U.S. Cl. 84—471 SR 7 Claims



1. An aid for selecting chord inversions comprising:

a. a panel having displayed thereon the names of the scale tones of a given key signature, the relative spacing between said scale tone names being proportional to the spacing of the counterpart keys of a piano keyboard;

b. a generally planar slide member;

c. means to slideably engage said slide member with said panel;

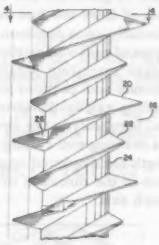
d. a plurality of indicator strips pivoted to said slide member and pivotal into a position in which said strips register with a plurality of said named scale tones, whereby upon sliding said sliding member relative to said panel and the selective pivoting of said strips into said registering position, a root triad or an inversion thereof may be alternatively selected on said panel sequentially for a plurality of different root tones.

3,937,119

MASONRY ANCHOR DEVICE

Richard John Ernst, Elk Grove Village, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.

Filed Dec. 23, 1974, Ser. No. 535,536
Int. Cl.² F16B 25/00
U.S. Cl. 85—47 10 Claims



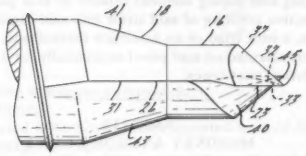
1. An anchor device for insertion and retention in a bore of a predetermined diameter formed in a masonry type support surface, the device comprising an axially extending shank with an enlarged head portion at a trailing extremity, the head portion including rotation inducing surfaces, a helical thread with a sharp crest formed on the shank and extending substantially the entire length of the shank providing a first plurality of convolutions extending along the shank, helical guide means formed on the shank extending substantially the entire length of the shank and providing a second plurality of convolutions extending along the shank, the guide means being of substantially uniform predetermined crest diameter along the length of the shank, the second plurality of convolutions being

positioned between adjacent first plurality of convolutions along the shank, the helical thread having a predetermined crest diameter which is greater than the predetermined crest diameter of the helical guide means, and which uniformly decreases from the trailing extremity of the shank to the entering extremity, notch means formed in the crests of the helical thread on at least a plurality of the first convolutions adjacent the entering extremity of the shank, the notch means thereby enabling the sharp crests of the helical thread to become firmly embedded in the side walls of the bore as the device is rotated about its longitudinal axis by chipping the side wall of the bore to an increasing depth as the helical thread progresses into the bore, the diameter of the helical guide means being substantially equal to the predetermined diameter of the bore so that the device is centered in the bore and the embedment of the crest portions of the helical thread is substantially uniform about the periphery of the shank, the adjacent first and second convolutions being spaced from each other along the shank thereby providing a reservoir to receive and retain the masonry material removed from the side walls of the bore due to the embedment of the crest portions of the helical thread therein.

3,937,120
DRILL SCREW

Robert A. Munse, Troy, Mich., assignor to Microdot Inc., Greenwich, Conn.

Filed Jan. 28, 1975, Ser. No. 544,744
Int. Cl.² F16B *25/00*
U.S. Cl. 85—47 **5 Claims**



1. A drill screw having a driving head and a threaded, threading shank, characterized by a drilling tip having flutes bounded on one side by generally flat longitudinal front wall portions axially spaced from the free end of said drilling tip and located substantially on a common diametric plane, the radially outer margins of said wall portions defining longitudinal side cutting edges extending parallel to the axis of the screw, and flat extension wall portions joined to said front wall portions and extending axially therefrom to the free end of said tip and inclined forwardly in the direction of rotation and having end margins defining end cutting edges which throughout their entire length are displaced angularly forwardly from said diametric plane in the direction of rotation and lie on a plane parallel to such axis.

3,937,121
DOUBLE BREAK-OFF SCREW

Keith E. Schubert, Rowayton, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

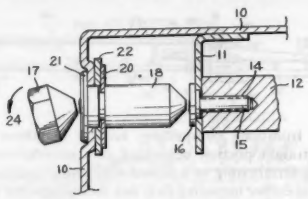
Filed Apr. 14, 1975, Ser. No. 567,731
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 **9 Claims**

1. A double break-off screw for use with a security cover plate and an inner retaining member disposed within said cover plate, said double break-off screw having three sections and comprising:

a fastening section having screw threads and fastening to said inner retaining member by torsional means;

an intermediate section disposed between said security cover and said inner retaining member, said intermediate section connected to said fastening section on one end thereof by means of a narrowed torsional break-off section, and connected to said security cover plate on an opposite end thereof; and

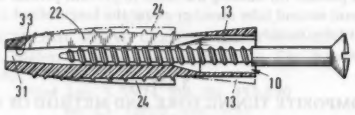
a rotatable installation section connected to said intermediate section by means of a narrowed break-off section, said installation section being disposed externally of said security cover plate, and being rotatable to drive said fastening section into said inner retaining member until seated, whereby said intermediate section will shear from said fastening section about said torsional break-off section as said installation section is further rotated, said installation section then being removable from said intermediate section about the narrowed break-off section disposed therebetween.



3,937,122
EXPANDING MASONRY ATTACHMENT PLUG

Josef Riedel, Sipplingen (Bodensee), Germany, assignor to Tox-Dubel-Werk, Richard W. Heckhausen KG, Germany

Filed Jan. 7, 1974, Ser. No. 431,346
Int. Cl.² F16B *13/10*
U.S. Cl. 85—71 **10 Claims**



1. In combination a one-piece expanding masonry attachment plug and a threaded tightening screw:

said masonry plug extending longitudinally and comprising, along its longitudinal length, a circumferentially continuous head at one end, a circumferentially continuous foot at the other end and a shank joining said head and said foot;

said head having a wide insertion hole extending through it to said shank; said shank having a substantially cylindrical exterior having a through guide hole therein extending continuously from said insertion hole to said plug foot;

said shank having a plurality of longitudinally extending slits arrayed about it and extending through said shank from its exterior into said through guide hole, thereby dividing said shank into flexibly expandable segments; all said segments being rejoined at and by said head and said foot, the exterior surfaces of said segments being provided with protuberance means for engaging the walls of a hole;

said foot having a through passage hole therethrough aligned with and of greater diameter than said shank through guide hole and smaller in diameter than the screw to be tightened into said through passage hole; an inside wall in said foot defining said through passage hole; said plug foot being sufficiently thick and strong so as not to expand upon a screw being tightened into said through passage hole;

said screw having a tapered lead-in portion and a cylindrical engaging portion with the major diameter of the cylindri-

cal portion being less than the diameter of the insertion hole; said major diameter of said screw being greater than the diameter of said shank through guide hole at the part of said screw which seats inside said shank through guide hole; the shank of said screw having a length excluding said tapered lead-in portion which is greater than the distance from said one end of said plug to and including at least a portion of said foot through passage hole while said shank is not axially compressed; said major diameter of said screw also being greater than said foot through passage hole such that said screw is adapted to cut a thread into said foot inside wall;

said shank through guide hole along the portion of its length extending past said slits being defined by said shank segments to be narrower than said insertion hole and narrower than said major diameter of said screw;

said shank segments being outwardly bendable with respect to said through guide hole upon axial compression of said shank;

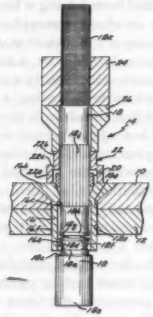
whereby a tension thread is cut in said foot as said screw is tightened through said foot, and further tightening of said screw draws said foot toward said head and axially compresses said shank.

3,937,123

BLIND FASTENER WITH SHEAR WASHER

Josip Matuschek, Newport Beach, and Johan August Louw, Orange, both of Calif., assignors to Textron Inc., Santa Ana, Calif.

Filed Apr. 8, 1974, Ser. No. 458,710
Int. Cl.² F16B *13/06*, *33/02*
U.S. Cl. 85—72 8 Claims



1. A blind fastener for tening together at least two members comprising in comb tion,

a sleeve adapted for in tion in aligned holes in said members and having a th gh opening and an enlarged head incapable of passing through said holes,

a stem slidable within said through opening of said sleeve and having an enlarged end portion at the end of said sleeve opposite said head,

a one-piece washer slidably received upon the stem and including a radially outer element of such size as to be engagable with the head of said sleeve and a radially inner element axially offset from said radially outer element in a direction away from said head and being joined thereto by a breakaway portion, said washer adapted to exert force on said head as a unitary structure with said breakaway portion adapted to fracture in response to a predetermined maximum force to separate the two elements,

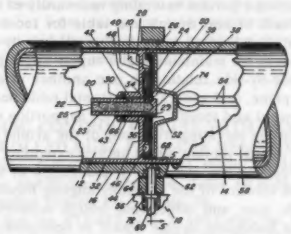
and a locking member initially separate from both elements of said washer and from said sleeve underlying the radially inner element and being engagable by said radially inner element as a result of and upon said breakaway portion responding to said maximum force to be forced by said radially inner element into cooperating means on said stem and sleeve to lock said stem and sleeve in their relative positions.

3,937,124

SETTABLE WARHEAD BURST RANGE SELECTOR

Rolf Krumes, Anaheim, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 20, 1974, Ser. No. 507,834
Int. Cl.² F42C *17/00*
U.S. Cl. 89—6.5 4 Claims



1. A settable warhead burst range selector for a flechette dispersing round which comprises:

a gun barrel having a chamber wall with a transversely positioned pin bore therein, said pin bore having a first gas seal therein;

a bulkhead section transversely positioned in the wall of said round intermediate a propellant chamber and a payload chamber, an axially positioned slide boss which protrudes from the rear side of said bulkhead into said propellant chamber, said boss having an axial bore and a second gas seal therein, an annularly shaped charge cavity positioned in the front side of said bulkhead, and at least one bore intermediate said charge cavity and said axial bore and communicating therewith;

an expulsion charge positioned in said charge cavity;

delay means for igniting said expulsion charge; and

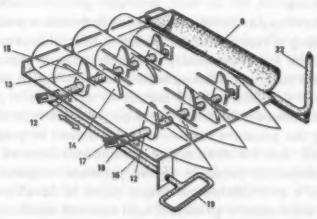
detent means for setting said delay so that said round is set in an extended-range mode or in a muzzle-burst mode.

3,937,125

DEVICE FOR LOADING AN ARTILLERY PIECE

Carl-Erik Eriksson, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Mar. 25, 1974, Ser. No. 454,498
Claims priority, application Sweden, Apr. 2, 1973, 73045882
Int. Cl.² F41F *9/02*
U.S. Cl. 89—45 7 Claims



1. A device for loading an artillery piece, particularly a heavy artillery piece, comprising a loading tray connected to the elevating mass of the artillery piece and mounted at the

rear end of said artillery piece directly adjacent one side of said elevating mass for selective displacement between a loading position and a ramming position, an elongated loading trough separate from said loading tray mounted along the side of said loading tray which is positioned outwards of said elevating mass, a separate generally horizontal loading table mounted along the side of said loading trough which is positioned outwards of said loading tray, the forward ends of said trough, tray, and table being generally in alignment with one another, the rearward ends of said trough and table also being generally in alignment with one another, said loading tray being significantly longer than said trough and table whereby said tray defines a forward portion for receiving a shell and an integral rearward portion extending rearwardly of the aligned rearward loads of said trough and table for receiving a cartridge case, said loading table having selectively releasable latching means for maintaining and supporting a plurality of shells in side-by-side relation to one another in a generally horizontal plane, said generally horizontal table being slightly inclined toward said trough, means for supporting said trough coaxially on the elevating trunnions of the artillery piece for selectively pivotal motion about an axis extending in a direction transverse to the direction of elongation of said trough and located forward of the generally aligned forward ends of said trough, tray, and table, said trough supporting means including a balancing device which is operative, when the trough is empty, to hold the trough at a starting position wherein the side of the trough outwards of said loading tray and adjacent to the loading table is substantially level with the lowermost edge of said inclined table, said trough support means being arranged, when a shell is placed in said tray, to cause the weight of the shell to counteract the balancing device and to effect a pivotal motion of said trough about said axis in the lateral region between said table and the forward portion of said tray thereby to cause the trough to assume an inclination in its direction of elongation which corresponds to the inclination of said loading tray, means for selectively releasing said latching means to cause a shell to roll along said generally horizontal plane downwardly from said table into said trough when said trough is empty thereby to effect said pivotal motion of said trough, means for laterally tilting said trough about its axis of elongation when a shell is in said trough thereby to roll said shell laterally out of the side of said trough which is adjacent to said tray and onto said forward portion of said loading tray when said tray is in its loading position, and means for thereafter moving said loading tray from its loading position to its ramming position.

3,937,126
REACTION HOLD-OFF MEANS FOR A TWO STAGE SERVOMOTOR

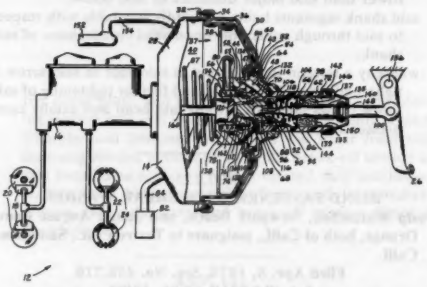
Frederick G. Grabb; Carl D. Owens, and Delbert J. Gardner, all of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Mar. 29, 1974, Ser. No. 456,347
Int. Cl.[2] F01B *25/02;* **F15B** *9/00*
U.S. Cl. 91—6 **7 Claims**

1. In a servomotor having a pressure responsive wall means for separating a front chamber from a rear chamber with a control means for sequentially presenting air at atmospheric pressure and air above atmospheric pressure from a source to the pressure responsive wall means to establish a pressure differential between the front chamber and the rear chamber for moving the pressure responsive wall means to produce an output force, and for delaying the communication of said air above atmospheric pressure to the pressure responsive wall means until a predetermined output force is developed from said air at atmospheric pressure, said control means comprising:

first hub means connected to said wall means having a rearward axial projection which extends through the rear chamber into the atmosphere, said rearward axial projection having a first axial bore with a first passage, a second passage and a third passage, said first passage being in communication with said front chamber, said second passage being in communication with the rear chamber and a third passage in communication with air at atmospheric pressure, said first axial bore having a first shoulder which separates the first passage from the second passage, said first shoulder having a first face adjacent the first passage and a second face adjacent the end of the first hub means, said first hub means having an annular horizontal projection extending from adjacent the first shoulder;

second hub means attached to said first hub means for holding the wall means in a fixed relationship with said first hub means, said second hub means having a second axial bore concentric to said first axial bore, said second



hub means having a third axial bore concentric to and separated from said second axial bore by a second shoulder, said third axial bore having a fourth passage in communication with air above atmospheric pressure;

plunger means having a cylindrical body with first surface located in said second axial bore, a second surface having a peripheral surface substantially equal to the first axial bore and a third surface having a peripheral surface smaller than said first shoulder in the first axial bore, said cylindrical body having a spherical recess for retaining an input rod from an actuator, said plunger means having a third shoulder between the first and second surfaces on the cylindrical body;

first valve means located in said axial bore for regulating the communication between the first passage and the first axial bore;

first resilient means for urging said first valve means into contact with said third surface of the plunger means to permit vacuum present in the front chamber to be communicated to the rear chamber through the first and second passages;

second valve means located in said third axial bore for regulating the communication between the fourth passage and the first axial bore;

second resilient means for urging said second valve means into contact with said annular horizontal projection to prevent communication of air above atmospheric pressure into the first bore;

third resilient means for urging said push rod and attached plunger means toward said first valve means and for positioning said second surface of the plunger means on the second face of the first shoulder of the first hub means;

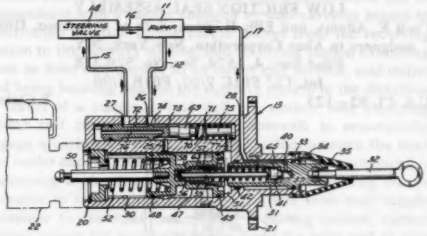
check valve means associated with the first axial bore to prevent communication of air above atmospheric pressure to the atmosphere through the third passage; and

deformable means connected to said plunger means and normally disengaged from said second valve means for radially expanding and axially compressing as a function of input force to output force to proportionally engage and actuate said second valve means to allow air above atmospheric pressure to be presented to said pressure responsive wall means.

3,937,127
HYDRAULIC BRAKE BOOSTER WITH SHUT-OFF MEANS

James P. Baker, Portland, Oreg., and Richard J. Silagy, Parma, Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Feb. 1, 1974, Ser. No. 438,624
Int. Cl.[2] F15B 9/10
U.S. Cl. 91—372 10 Claims



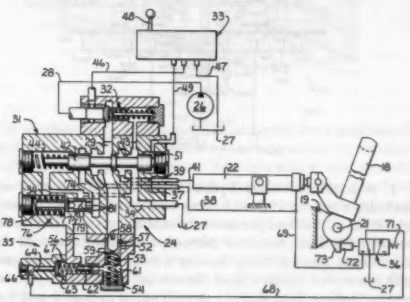
1. A motor vehicle fluid power circuit comprising a pump, a steering valve, and a brake booster, said pump having an inlet and an outlet and a relief valve hydraulically connecting said inlet to said outlet at a predetermined relief pressure, said brake booster having a power chamber, means hydraulically connecting said pump outlet and inlet to said steering valve and further means hydraulically connecting said pump outlet and inlet to said power chamber, said further means including an inlet passage in said brake booster hydraulically connecting said pump outlet to said power chamber and an outlet passage in said brake booster hydraulically connecting said pump inlet to said power chamber, a first valve surface in said brake booster movable in said outlet passage relative to said power piston between an open position and a closed position for opening and closing said outlet passage, a second valve surface in said brake booster movable in said inlet passage relative to said power piston between an open position and a closed position for opening and closing said inlet passage, shut-off means for moving said second valve surface relative to said power piston from said open position to said closed position to close said inlet passage and completely block said inlet passage to hydraulically isolate said pump outlet from said power chamber in response to the fluid pressure in said power chamber reaching a predetermined shut-off pressure, said shut-off means including a member movable relative to said first valve surface and having a fluid pressure surface exposed to fluid pressure in said power chamber and means communicating said fluid pressure in said power chamber with said fluid pressure surface, said member being operatively connected to said second valve surface to move said second valve surface relative to said power piston to said closed position when said fluid pressure in said power chamber reaches said shut-off pressure, said first valve surface being in said closed position to close said outlet passage and completely block said outlet passage to hydraulically isolate said fluid power chamber from said pump inlet when said member fluid pressure surface operates to close said second valve surface in response to said shut-off pressure, whereby said first and second valve surfaces prevent fluid flow through said power chamber from said inlet passage to said outlet passage when said shut-off pressure is reached, and said shut-off pressure being less than said relief pressure of said pump relief valve.

7. A motor vehicle fluid power circuit comprising a pump, a steering valve, and a brake booster, said pump having an inlet and an outlet and a relief valve hydraulically connecting said inlet to said outlet at a predetermined relief pressure, said brake booster having a power chamber, means hydraulically connecting said pump outlet to said steering valve and further means hydraulically connecting said pump outlet to said power chamber, valve means in said further means movable between an open position establishing fluid pressure communication between said pump outlet and said power chamber and a closed position hydraulically isolating said pump outlet from said power chamber, and rod means slidably disposed in said power chamber, said rod means having a first lateral cross-sectional area exposed to the pressure in said power chamber and a second lateral cross-sectional area exposed to the pressure in said pump inlet, said rod means being mechanically connected to said valve means in said further means, said rod means being responsive to a predetermined shut-off pressure in said power chamber acting against said first lateral cross-sectional area to move said valve means from said open position to said closed position to prevent the pressure in said power chamber from exceeding said predetermined shut-off pressure, and said shut-off pressure being less than said relief pressure of said pump relief valve.

3,937,128
HYDRAULIC CONTROL CIRCUIT WITH REMOTELY CONTROLLED DUAL PRESSURE RELIEF VALVE

Leon E. Hicks, Joliet; John W. Grant, Pekin; Loyal O. Watts, Mapleton, and Wayne A. Peterson, Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 412,452, Nov. 2, 1973, Pat. No. 3,847,416.
This application June 24, 1974, Ser. No. 482,316
Int. Cl.[2] F15B 15/20, 11/08, 13/042
U.S. Cl. 91—392 3 Claims



1. A hydraulic control circuit for operating a double-acting hydraulic jack and for providing fluid to the jack at a relatively high pressure when the jack is being operated in a selected direction, the circuit providing fluid to the jack at a relatively low pressure when the jack is being operated in the opposite direction, comprising

a source of fluid,

a control valve having an inlet passage in communication with the source and a movable spool means for selectively communicating opposite ends of the jack with the inlet passage and a fluid drain respectively, the jack being operated in the selected direction by fluid pressure directed to a first end of the jack from the inlet passage,

a pilot operated dual pressure relief valve communicating the inlet passage to drain, the relief valve normally establishing the relatively low fluid pressure in the inlet passage, and

pilot control means operatively responsive to the jack and in communication with the dual pressure relief valve to condition the relief valve for establishing the relatively high fluid pressure in the inlet passage when the spool means of the control valve is positioned to operate the jack in the selected direction,

the dual pressure relief valve including means responsive to a hydraulic pilot signal for establishing the relatively high pressure, the pilot control means comprising a pilot valve

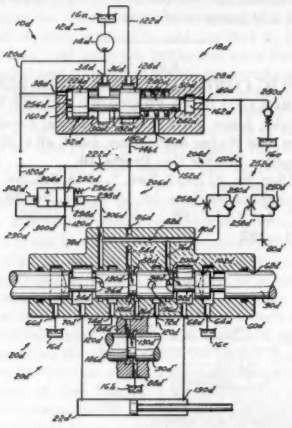
for establishing the pilot signal communicated to the hydraulically responsive means, the pilot valve being operatively coupled with the jack to interrupt the pilot signal as the jack approaches a predetermined limit of travel in the selected direction.

3,937,129

LOAD RESPONSIVE SYSTEM WITH AREA CHANGE FLOW EXTENDER

Wendell E. Miller, Warsaw, Ind., assignor to The Scott & Fetzer Company, Cleveland, Ohio

Filed Oct. 23, 1974, Ser. No. 517,244
Int. Cl.² F16B *13/08*
U.S. Cl. 91—412 43 Claims



1. A load-responsive hydraulic system of the type which includes a source of fluid having a pump that delivers pressurized fluid at the fluid pressure thereof and a sump that receives fluid at the fluid pressure thereof, a fluid-actuated device, a directional control valve having a body that is connected to said source to receive fluid therefrom at said pump pressure and to deliver fluid thereto at said sump pressure and having a movable valving element that is movable to a standby position wherein said fluid-actuated device is isolated from said pump and to an operating position wherein pressurized fluid is supplied from said pump to said device at the load-actuating pressure thereof, and a differential pressure actuated bypass valve having a housing that is connected to said source for bypassing of fluid from said pump to said sump and having a valve spool that includes both a first fluid-responsive area connected to said pump for actuating said valve spool to a bypassing mode by said pump pressure wherein said pump fluid is bypassed to said sump and a second fluid-responsive area for actuating said valve spool to an operating mode wherein said bypassing is occluded, the improvement which comprises:

a third fluid-responsive area in said bypass valve, being operably connected to said valve spool, and being effective to actuate said valve spool to one of said modes by a force that is proportional to the fluid pressure applied thereto and by a distance proportional to the movement thereof;

second area signal means, including a signal port in said control valve that is connected to said second fluid-responsive area and including said valving element, for establishing a fluid flow path in said control valve between said signal port and said fluid-actuated device to sense said load-actuating pressure thereby, for applying said load-actuating pressure and the changes thereof to said second area when said control valve is in said operating position, and for attenuating said load-actuating pressure that is applied to said second area when said control valve is in said standby position; and

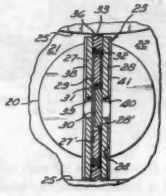
third area signal means, being connected to said third fluid-responsive area and to said source, and being responsive to said pump pressure, for applying said pump pressure to said third area, and for applying another of said pressures to said third area.

3,937,130

LOW FRICTION SEAL ASSEMBLY

Cecil E. Adams, and Ellis H. Born, both of Columbus, Ohio, assignors to Abex Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,318
Int. Cl.² F01C *9/00*; F01B *3/00*
U.S. Cl. 92—125 8 Claims



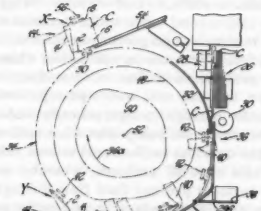
1. A fluid energy translating device comprising a housing, a member movably mounted in the housing and dividing the housing into first and second fluid-receiving chambers, fluid supply means for selectively supplying high pressure fluid to the first and second chambers, a seal assembly carried by the member to seal the first and second chambers from one another, the seal assembly having a pair of back-up plates positioned within the member and slidable with respect thereto, a spacer positioned between the back-up plates, an elastic member mounted on the perimeter of the spacer, and a seal member which engages the walls of the housing and has an opening in which the elastic member is positioned, the elastic member being mechanically squeezed radially between the spacer and seal member to bias the seal member against the housing walls and squeezed laterally between the back-up plates.

3,937,131

CARTON FEEDING APPARATUS

Robert C. Kellogg, Milford, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed July 19, 1974, Ser. No. 489,880
Int. Cl.² B31B *1/76*
U.S. Cl. 93—53 SD 32 Claims



1. Carton feeding and erecting apparatus for transferring flattened cartons from one location to another while simultaneously unfolding the cartons to an erect condition, said apparatus comprising: means defining a carton receiving station at one location; means defining a carton delivery station at an-

other location; carton carrying means operable to engage a flattened carton at the receiving station and carry the carton to the delivery station; carton unfolding means operatively associated with said carrying means operable to unfold a carton to its erect condition as the carton is carried by the carrying means from the receiving station to the delivery station; clamping means having a clamping position in which it is operable to engage a flattened carton at said receiving station and hold it in a position to be engaged by said carrying means to be carried from the receiving station to the delivery station, said clamping means being operable to move out of engagement with a carton engaged by said carrying means to a retracted position as the carton moves from the receiving station to the delivery station; said receiving station extending from an inlet end thereof to an outlet end thereof, said outlet end being locating nearest the delivery station in the direction of travel of a carton to said delivery station, said clamping means and carrying means being operable to sequentially engage a carton when the carton is located between the inlet and outlet ends of said receiving station; a supply container for containing a plurality of flattened cartons; unloading means operable to transfer cartons one at a time from said supply container to the inlet end of said receiving station; carton driving means for moving a carton from the inlet end of said receiving station to a position to be engaged by said clamping means; and, carton orienting means operable to engage and orient a carton being moved by said driving means in a position to be engaged by said clamping means.

3,937,132

AIR OUTLET APPARATUS

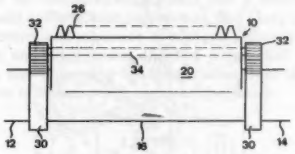
Josef Bruhlmeier, Wettingen, and Andreas Gasser, Zurich, both of Switzerland, assignors to Luwa AG, Zurich, Switzerland

Filed June 17, 1974, Ser. No. 480,020

Claims priority, application Switzerland, June 19, 1973, 8859/73

Int. Cl.² F24F *13/08*

U.S. Cl. 98—40 N **17 Claims**



1. An air outlet apparatus comprising a housing, at least one infeed conduit for operatively communicating the housing with an air preparation installation, said housing possessing an elongate substantially tubular-like body bounded by an outer surface, said tubular-like body being provided with throughpassage openings extending in the lengthwise direction thereof and at least over a portion of the outer surface, a mounting carried by said tubular-like body, said mounting having an outer wall, said outer wall enclosing a compartment between the mounting and the outer surface provided with said throughpassage openings of said tubular-like body, said throughpassage openings flow communicating the interior of said tubular-like body with said compartment, said mounting possessing a multiplicity of outlet openings distributively arranged in the axial direction of the tubular-like body, a portion of the tubular-like body being located internally of the mounting and said internally located portion of the tubular-like body being equipped with said throughpassage openings, a thin-foil throttle slide member positioned at said tubular-like body for coaction with said throughpassage openings thereof in order to regulate the flow of air between the interior of the tubular-like body into said compartment of the mounting and then through the outlet openings thereof, said thin-foil throttle slide member extending axially of the tubular-like body, and rotatable ring means cooperating with opposed ends of said thin-foil throttle slide member, means for operatively interconnecting said ring means at said opposed ends of said thin-foil throttle slide member with one another, rotation of any one of said ring means bringing about substantially equal circumferential movement of said thin-foil throttle slide member relative to the outer surface of said tubular-shaped body for selectively opening and closing said throughpassage openings.

3,937,133

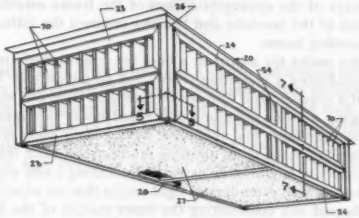
OUTLETS FOR CONDITIONED AIR AND MOUNTING FRAMES THEREFOR

Mannie Bertin, 47 Linron Drive, Danbury, Conn. 06810, and Ira L. Bertin, Box 25, Limington, Maine 04049

Filed Sept. 27, 1974, Ser. No. 510,001

Int. Cl.² F24F *13/14*

U.S. Cl. 98—40 D **15 Claims**



1. A module for use as a part of an outlet for conditioned air and to support, be supported by, or connected to another part of said outlet, said other part having a spline, said module comprising a frame including upper and lower side members and end members, said members having their ends mitered and abutting, means interconnecting said ends, air affecting means supported by the frame side members, each member an appropriate length of an extrusion including a side wall and a supporting wall extending at right angles thereto adjacent the edge thereof that is the inner edge of the frame, said extrusion also having a splineway the entrance of which extends lengthwise of the outer surface of the side wall adjacent its other edge, the splineway extending inwardly towards the supporting wall with its inner end substantially at a right angle relative to the entrance, the outer surface of the splineway having at the entrance a bearing and the inner surface thereof a shoulder, the entrance and the shoulder at least partly in a plane parallel to said side wall whereby with the spline of said other part of a cross sectional shape generally similar to that of the splineway and dimensioned to be freely slidable lengthwise therein, said other part and said frame are connectable with one angularly displaced relative to the other, with the spline entered in a splineway entrance and the one turned relative to the other with the bearing as the pivot to bring said part and said frame into their desired relationship and to seat the spline fully in said splineway.

8. An outlet for a port in a duct for conditioned air, said outlet including a mounting frame and an air diffuser, means connecting said diffuser to said frame, said diffuser including walls and means interconnecting said walls in a predetermined angular relationship and establishing the corners of the diffuser, each of said walls including at least one module, each module comprising a frame including upper and lower side members and end members, said members having their ends mitered and interconnected in an abutting relationship, each member an appropriate length of an extrusion including a side wall and a supporting wall extending at right angles thereto adjacent an edge thereof and constituting the inner margin of

the frame, means interconnecting the abutting ends of said members, air affecting means supported by at least one frame, said extrusion also having a splineway with an entrance extending lengthwise of its outer surface adjacent its other edge and extending inwardly towards the supporting wall with its inner end substantially at right angles to the entrance, the outer surface of the splineway defining a bearing at the entrance and the inner surface thereof defining a shoulder, the bearing and the shoulder at least partly in a plane parallel to said side wall, each corner establishing means including a predetermined length of an extrusion having sides disposed to establish said predetermined angular relationship, each side including a marginal spline portion extending from end-to-end thereof and approximately of the shape of said splineways and a fit therein and dimensioned for entry therein through the ends thereof, said spline portions entered in the splineways of the proximate end frame members and extending from end-to-end thereof, means holding the module connectors from escaping from the splineways in which their spline portions have been entered, and said frame including depending spline portions that are substantially identical to the first named spline portions, said last named spline portions entered within the splineways of the appropriate ones of the frame establishing members of the modules and thereby connect the diffuser to the mounting frame.

13. An outlet for a port in a duct for conditioned air, said outlet including a mounting frame and an air diffuser in the form of a register, said diffuser including at least one module comprising a frame including upper and lower side members and end members, said members having their ends mitered and interconnected in an abutting relationship, each member an appropriate length of an extrusion including a side wall and a supporting wall extending at right angles thereto adjacent an edge thereof and constituting the inner margin of the frame, means interconnecting the abutting ends of said members, air affecting means supported by each frame, said extrusion also having a splineway with an entrance extending lengthwise of its outer surface adjacent its other edge and extending inwardly towards the supporting wall with its inner end substantially at right angles to the entrance, the outer surface of the splineway defining a bearing at the entrance and the inner surface thereof defining a shoulder, the bearing and the shoulder at least partly in a plane parallel to to said wall, and means connecting the margins of the diffuser to the mounting frame and including spline portions of substantially the size and shape of the splineways of the frame members that define the margins of the diffuser and entered therein.

3,937,134
COFFEE FILTERING

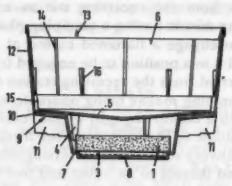
Albert Meijlom Molenaar, Terkaple, and Melle Veenstra, Appelhoflaan, Joure, both of Netherlands, assignors to Douwe Egberts Tabaksfabriek-Koffiebranderijen-Theehandel B.V., Utrecht, Netherlands

Continuation-in-part of Ser. No. 208,098, Dec. 15, 1971, Pat. No. 3,800,690. This application Jan. 11, 1974, Ser. No. 432,522. The portion of the term of this patent subsequent to Apr. 2, 1991, has been disclaimed.

Int. Cl.² A47J *31/02, 31/10*

U.S. Cl. 99—295 **3 Claims**

1. An apparatus for making coffee by oncethrough percolation of preheated water, comprising a reservoir for receiving the water, an extraction chamber for ground coffee separated from said reservoir by a wall which is perforated in such a way that when the apparatus is used the water flows or trickles from said reservoir to said chamber through gravity, a coffee tablet disposed in said chamber, and furthermore the extraction chamber comprises a support for a filter, said support leaving the greater part of the filter surface clear, and wherein the extraction chamber comprises a continuous annular collar means for supporting said tablet of roasted and ground coffee thereon above said filter and so constructed and arranged that the bottom of the coffee tablet is approximately parallel to said filter and located at a distance within the range of approx-



imately 0.5 to 4mm. from said filter, and including means for retaining the tablet against the said collar.

3,937,135
APPARATUS FOR THE FAST COOKING, IN HOT WATER, OF DOSED QUANTITIES OF FOODSTUFFS IN GENERAL

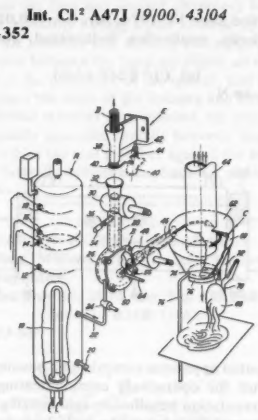
Modesto Pratolongo, Milan, Italy, assignor to Santa Martha Bay Shipping and Trading Co., Ltd., Curacaco, Netherlands Antilles

Division of Ser. No. 289,941, Sept. 18, 1972, Pat. No. 3,827,344. This application May 13, 1974, Ser. No. 469,602

Claims priority, application Italy, Oct. 9, 1971, 29724/71; Oct. 9, 1971, 29725/71; Oct. 9, 1971, 29726/71. The portion of the term of this patent subsequent to Aug. 6, 1991, has been disclaimed.

Int. Cl.² A47J *19/00, 43/04*

U.S. Cl. 99—352 **11 Claims**



1. Apparatus for cooking, in hot water, metered quantities of foodstuffs such as rice, noodles and the like, including a pressurized cooking chamber provided with means to maintain, in said chamber, pre-selected water pressures and temperatures, said chamber having a first opening for the introduction of raw foodstuff and a second opening for the extraction of cooked food characterized by metering means for introducing raw foodstuffs to the cooking chamber, a hot water generator for boiling water to temperatures over 100° C. the generator being connected to said cooking chamber, to maintain food metered into the chamber submerged in hot water during a cooking operation, and further characterized by separating means connected to the extraction opening of the cooking chamber to receive cooked food from the chamber, and separate cooking water therefrom.

3,937,136

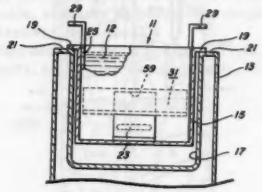
FILTER DEVICE FOR DEEP FAT FRYER

Elton D. Cox, 2875 Bannockburn, Memphis, Tenn. 38138

Continuation-in-part of Ser. No. 431,934, Jan. 9, 1974, abandoned. This application Nov. 15, 1974, Ser. No. 524,191

Int. Cl.[2] A47J 37/12

U.S. Cl. 99—408 21 Claims



1. In combination with a deep fat fryer having a deep fat container for holding a quantity of liquid fat used in the frying process, of a submergible filtering device, for filtering foreign particles from the liquid fat, said submergible filter device comprising a pan for accomplishing the cooking process therein, said pan being provided with at least one opening disposed adjacent the lowermost portion thereof, means for facilitating submergence and emergence of said pan into and out of the liquid fat, the liquid fat being caused to pass through said opening to fill said pan with the fat as said pan is being submerged therein and to empty said pan as it is being emerged therefrom, a unit removably engaging said pan and cooperating with said opening thereof for directing the outwardly flowing liquid fat along a predetermined course, said unit having at least one substantially horizontally disposed plate-like member positioned a spaced distance from the bottom of said pan and establishing at least one channel defined in part by said pan and said unit, said unit being provided with a passageway leading into said channel with said passageway being disposed remote from said opening; said channel communicating said passageway with said opening whereby the liquid fat contained within said pan is directed to pass through said opening, said passageway, and along said channel in a predetermined sequence as said pan is emerged from the liquid fat; and filter means disposed within said channel for capturing and separating foreign particles from the liquid fat as said pan is caused to be emerged therefrom.

3,937,137

PANCAKE MAKING MACHINE

Paul Marrie, Dijon, France, assignor to S.A.R.L. "ETUD", Quetigny, France

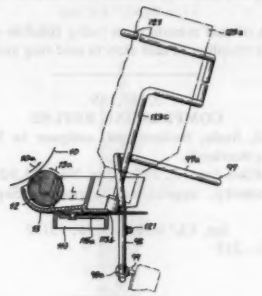
Division of Ser. No. 241,309, April 5, 1972, Pat. No. 3,853,045. This application Apr. 15, 1974, Ser. No. 461,108

Claims priority, application France, Apr. 7, 1971, 71.12242; July 5, 1971, 71.24434; Feb. 25, 1972, 72.06409. The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.[2] A21B 1/48

U.S. Cl. 99—423 6 Claims

1. In a pancake making machine comprising a trough adapted to receive a supply of batter, a drum rotatable adjacent said trough and formed with a continuous cylindrical peripheral surface except for an axially extending recess, a rotatable transfer roller with access to the batter in said trough closely juxtaposed with said drum, means for rotating said roller and said drum for transferring batter from said trough to said drum, means for heating said drum and baking the batter thereon, and scraper means downstream from said roller in the direction of drum rotation for removing the baked batter from said drum, the improvement comprising means including a vertically and pivotally displaceable handle for displacing said trough and said roller toward and away from said drum and latching means for holding said roller in a position immediately adjacent said drum, said latching means being vertically displaceable by vertical displacement of said handle from an upper position retaining said roller immediately adjacent said drum and a lower position wherein said roller may be retracted from said drum, said means for rotating including a drive motor and a switch controlling said drive motor, said switch being engaged by said means including said handle during vertical movement of said handle such that in the up position of said handle said switch is held closed to operate said drive motor and in the down position of said handle said switch is open to stop operation of said drive motor.



3,937,138

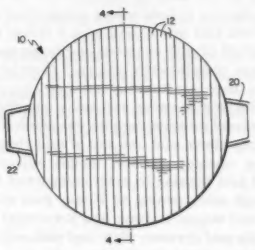
BARBECUE GRILL

Felix M. Tidwell, Suite 207 Lexington Bldg., 3319 Maguire Blvd., Orlando, Fla. 32803

Filed Jan. 28, 1974, Ser. No. 436,835

Int. Cl.[2] A47J 37/06

U.S. Cl. 99—450 6 Claims



1. A grate for a barbecue grill, this grate to be positioned above a radiant heat source and to support food to be cooked by the heat therefrom, the food having a frying substance associated therewith, comprising:

metal support assembly means for supporting the food and for supporting a substantial portion of the frying substance in a position contiguous to the food,

said support assembly means including

a plurality of parallel, spaced apart slats defining a plurality of minute slots between adjacent edges thereof,

a continuous ring rigidly coupled to the bottom surface of each of said slats adjacent the ends of each of said slats, and

a plurality of spaced apart parallel support rods rigidly coupled to the bottom surface of each of said slats extending perpendicular to said slats and rigidly coupled at their ends to the inside periphery of said ring;

said slats each having a substantially flat top surface; and

said minute slots each having a width much less than one-half the width of each of said slats, thereby allowing smoke from the radiant heat source to pass upwards into contact with the food on said support assembly means and allowing only a small portion of the frying substance to pass downwards through said support assembly means where it contacts the radiant heat source and forms the smoke,

said width of said minute slots being fixed in dimension by the rigid coupling of said slats to said ring and said rods.

3,937,139
COMPRESSING REFUSE

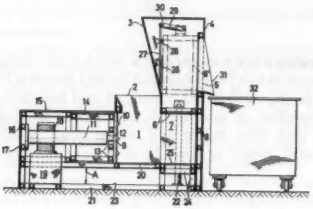
Ulrich Lendi, Stafa, Switzerland, assignor to Mageba S.A., Bulach, Switzerland

Filed Sept. 3, 1974, Ser. No. 501,924

Claims priority, application Germany, Sept. 5, 1973, 2344698

Int. Cl.² B30B *15/30*, *15/32*

U.S. Cl. 100—215 **5 Claims**



1. Apparatus for compressing refuse and discharging the compressed refuse downwardly into a separate container comprising the combination of: a refuse receiving chamber, a pressure plate adapted to reciprocate within said chamber between two closed ends thereof, a movable four walled cage which rests in one position adjacent one of said closed ends and being adapted to hold refuse compressed therein between said plate and said one closed end, a refuse feeding opening in one sidewall of said chamber and being positioned so that refuse moves therethrough into said chamber at one side of said cage, a discharge housing mounted above and in communication with said chamber and being adapted to receive said cage in a second position thereof, one sidewall of said housing being directly above said one end of said chamber and having a discharge opening therein, means adjacent an opposite sidewall of said housing to eject compacted refuse from said cage through said opening so it may pass into said separate container and means to raise and lower said cage, said cage forming with said pressure plate and said one end wall a compression space closed on all sides.

3,937,140
BALER WITH EXTERIOR PLATEN GUIDE

Dennis E. Swanson, St. Cloud, Minn., assignor to Muncher Corporation, St. Cloud, Minn.

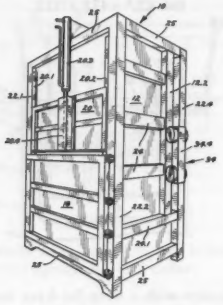
Filed Oct. 3, 1974, Ser. No. 511,751

Int. Cl.² B30B *1/16*

U.S. Cl. 100—245 **9 Claims**

1. In a baler for baling refuse and the like and including a pressing box, a platen movable axially in the pressing box to compress refuse into a bale, and hydraulic means to move the platen between a withdrawn position and a refuse compressing position,

the improvement comprising platen guide means including sets of rollers bearing inwardly against respective opposed sides of the baler with the roller axes substantially parallel to the respective side walls, and brackets attached to the platen and extending externally of the pressing box for mounting the rollers in rolling engagement inwardly against opposed sides of the pressing box to roll in a direction parallel to the axis of the box, each roller set including at least two rollers spaced axially of the box a significant distance to continuously maintain the orientation of the platen with respect to the axis of the pressing box.



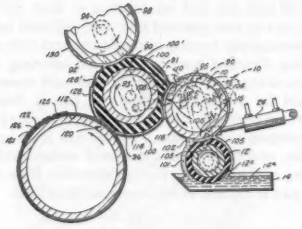
3,937,141
DAMPENER FOR LITHOGRAPHIC PRINTING PLATES

Harold P. Dahlgren, 726 Regal Row, Dallas, Tex. 75247

Filed June 17, 1974, Ser. No. 480,080

Int. Cl.² B41L *25/02*; B41F *7/26*

U.S. Cl. 101—148 **10 Claims**



1. Apparatus for applying dampening fluid over a roller having an ink-coated liquid receptive surface to a printing plate in a lithographic printing system, said ink-coated liquid receptive surface moving at a surface speed substantially equal to the surface speed of the printing plate, comprising: a dampening fluid transfer roller having a hydrophilic surface thereon; a metering roller having a smooth, resilient surface thereon; means to support the metering and transfer rollers in pressure indented surface relation to form a metering nip; support means arranged to urge a film of dampening fluid on the transfer roller into pressure relation with the ink-coated liquid receptive surface to form an interface between the ink and the dampening fluid; means to apply an abundant supply of dampening fluid to the surface of said metering roller; means to rotate said metering roller at a surface speed to maintain an abundant supply of dampening fluid adjacent said metering nip, said means to rotate said metering roller being adapted to rotate said metering roller at a surface speed substantially less than the surface speed of the ink-coated liquid receptive surface, said means to apply an abundant supply of dampening fluid to the surface of said metering roller being adapted to prevent application of an abundant supply of dampening fluid to the surface of the transfer roller except adjacent said metering nip, said transfer roller being driven by

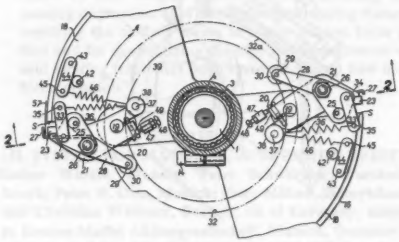
said ink-coated liquid receptive surface by frictional force transferred through said interface.

3,937,142

SHEET TRANSFER APPARATUS

Arnost Cerny, Blansko, and Jiri Svoboda, Svitavka, both of Czechoslovakia, assignors to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed May 10, 1973, Ser. No. 359,183
Claims priority, application Czechoslovakia, May 15, 1972, 3254-72
Int. Cl.² B41F 21/04
U.S. Cl. 101—409 4 Claims



1. In a sheet transfer device for a printing press having a pair of frame sides, and a cylinder comprising a rotatable shaft journalled within said frame sides, and, a plurality of segment members fixed to said shaft, said segment members being spaced axially of each other and arranged in a pair of sets to have a common peripheral surface and leading and trailing edges, each of said segment sets having mechanical gripper means mounted for seizing the leading edge of said sheet, and apparatus for seizing the trailing edge of said sheet comprising, a first rod axially extending through the segments of said cylinder and journalled for rotation about its longitudinal axis, brackets fixed to said rod and extending outwardly adjacent the trailing edge of said peripheral surface, a second axially extending rod journalled within said brackets exterior of the segments of said cylinder to rotate about its longitudinal axis, gripper elements carried by said second rod, a bar mounted at the end of said brackets forming a ledge adapted to cooperate with said gripper elements, means for rotating said second rod to cause said gripper elements to seize the trailing edge of a paper sheet and means for rotating said first rod comprising an eccentric circular cam mounted on one of said sides, a first cam follower mounted on the one bracket adjacent said one side and engaging said cam to thereby cause said one bracket to pivot said first rod, an eccentric pin mounted on said cylinder adjacent said one bracket, a pull rod pivotally mounted on said cylinder adjacent said pin, and spring means connecting said pull rod and said first cam follower to adjustably urge said first cam follower against the first cam, said means being operable during the seizing of the leading edge of the sheet to move said brackets away from the adjacent trailing edge of said peripheral surface to thereby stretch said sheet over the peripheral surface of said segment set.

3,937,143

DEVICE FOR POINT IGNITION OF A CHARGE

Heinz Schlueter, Merfeld near Duelmen, Germany, assignor to Wasag-Che-mie GmbH, Munich, Germany

Continuation of Ser. No. 847,565, Aug. 5, 1969, abandoned.
This application Jan. 2, 1974, Ser. No. 429,884
Claims priority, application Germany, Aug. 28, 1968, 1796082
Int. Cl.² F42B 3/12
U.S. Cl. 102—28 M 7 Claims

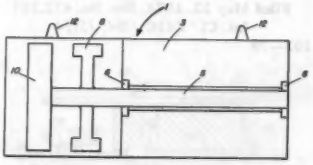
1. Device for point-ignition of a charge comprising a shell; a priming pellet at the top of said shell; a secondary explosive charge at the bottom of said shell; an initiating charge above and completely abutting said secondary explosive charge and a structural member within said shell interposed between said priming pellet and said initiating charge; said structural member including upper and lower chambers having sloping walls sloping outwardly substantially to the inner wall of said shell and an opening lying on the vertical axis of said structural member providing communication between said chambers, said upper chamber serving to convey the sparks produced by said priming pellet to said opening and said lower chamber being completely packed with said initiating charge and being symmetrical with respect to the vertical axis; the inner walls of said structural member forming said chambers converging towards said opening.

3,937,144

INTERNAL STABILIZING DEVICE FOR AIR AND WATER MISSILES

Peter Daniels, Fredericksburg, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 3, 1972, Ser. No. 268,346
Int. Cl.² F42B 25/00
U.S. Cl. 102—2 1 Claim



1. A nonself-propelling finless bomb adapted to be carried on and launched from aircraft at supersonic speeds comprising:

a casing having suspension means thereon for mounting the bomb on the aircraft;

an explosive warhead disposed within said casing;

a flywheel fixed to a shaft mounted for rotation within said casing on the longitudinal axis thereof; and

means for imparting rotation to said flywheel prior to launch whereby the angular momentum of the bomb is

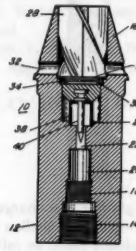
substantially increased, and its maximum angle of attack due to an angular rate correspondingly reduced, to minimize launch disturbances when the bomb separates from the aircraft.

3,937,145

HELICAL BAFFLE FOR THE DENSITY INTEGRATING FUZE HEAD

Wilhelm J. Lohninger, Rockaway, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 10, 1974, Ser. No. 468,723
Int. Cl.[2] F42C *1/00*
U.S. Cl. 102—73 R 1 Claim



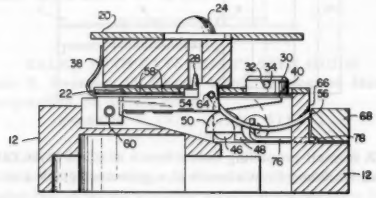
1. An improved impact sensitive fuze for explosive missiles comprising:
a truncated conically shaped body having a longitudinal axis and an axial bore;
said body having a plurality of apertures in its base extending transversely of said axial bore and communicating with said bore;
means for detonating said missile mounted in said bore; and
barrier means, mounted in said bore intermediate the front end of said bore and said detonating means, adapted to provide an effective cover for said detonating means, thereby preventing axially moving objects from striking said detonating means, while permitting small objects, such as droplets of water, to pass through said barrier means in directions inclined to the longitudinal axis, wherein said barier means is in the form of a twisted cruciform having a twist angle of at least 90°.

3,937,146

DUAL SIGNATURE SAFETY AND ARMING MECHANISM

Harry J. Davis, Wheaton, Md., and Leo P. Rongus, Washington, D.C., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 22, 1974, Ser. No. 472,247
Int. Cl.[2] F42C *1/04*, *15/24*
U.S. Cl. 102—78 9 Claims



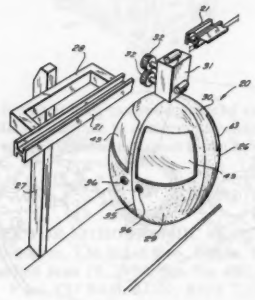
6. In a combination of an arming mechanism, a firing pin and a detonator, said arming mechanism comprises:
first means responsive to the acceleration force of said arming mechanism for biasing said detonator to move from a first position to an armed position;
second means adjacent said detonator for initially detaining said detonator from moving to said armed position;
third means including a pyrotechnic wire connected to said second means for maintaining said second means adjacent said detonator; and
fourth means for actuating said pyrotechnic wire to release said second means and allow said first means to move said detonator to said armed position.

3,937,147

PERSONALIZED RAPID TRANSIT SYSTEM

Balint Szent-Miklosy, Jr., 150 Haven Ave., Terrace 3, New York, N.Y. 10032

Filed Aug. 13, 1973, Ser. No. 388,058
Int. Cl.[2] B61D *11/00*; B61B *3/00*
U.S. Cl. 104—93 7 Claims



1. A personalized rapid transit system comprising; an interconnected network of rails, support means to locate the rails in a predetermined three-dimensional pattern, a plurality of vehicles with each vehicle adapted to carry at least one person therein and having a configuration which facilitates the removable nesting of vehicles when not in use, each vehicle having a substantially hemispherical portion tapering from an enlarged open end to a rear end of lesser diameter than the opening in the open end, door means on the vehicle shiftable between a position closing the open end to a position exposing the open end and permitting at least the tapered rear end of another vehicle to be placed within the vehicle thereby permitting the vehicles to be stored partially within one another when not in use, and connector and drive means on each vehicle and connected to the network of rails so that the vehicle is suspended from the rail network and is guided and supported thereby during travel and storage.

3,937,148

VIRTUALLY ZERO POWER LINEAR MAGNETIC BEARING

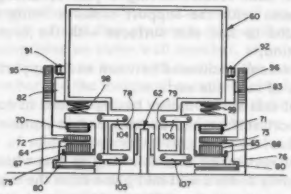
Paul A. Simpson, Woburn, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 320,430, Jan. 2, 1973, abandoned. This application Aug. 5, 1974, Ser. No. 494,943
Int. Cl.[2] B61B *13/08*
U.S. Cl. 104—148 MS 15 Claims

1. A magnetic levitation vehicle, which vehicle comprises:
linear magnetic bearing means for suspending said vehicle; and
means for propelling said vehicle along a guideway;
wherein said linear magnetic bearing means comprises a frame for the linear magnetic bearing which frame is connected to the magnetic levitation vehicle to permit limited movement of the frame indepdent of said vehicle, said bearing frame at least partially surrounding a stationary element of said guideway;

at least one permanent magnet attached to the bearing frame for suspending the bearing frame relative to said stationary element in a neutral force position in which the bearing frame is suspended entirely by the permanent magnet;

means for sensing displacement of the suspended bearing frame relative to the stationary element away from the neutral force position; and



electromagnet means attached to the bearing frame activated by said sensing means for counteracting forces causing displacement of the suspended bearing frame, for restoring the bearing frame to a new neutral force position and for deenergizing the electromagnet means when said bearing frame has been restored to said new neutral force position.

3,937,149

RAIL SYSTEM FOR MAGNETIC-SUSPENSION VEHICLES

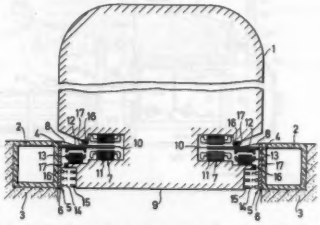
Günther Winkle, Munich; Peter Schwärzler, Furstenfeldbruck; Peter H. Otto, Munich; Peter Mölzer, Hebertshausen, and Christian Walkner, Dachau, all of Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Division of Ser. No. 378,966, July 13, 1973, Pat. No. 3,882,790. This application Aug. 26, 1974, Ser. No. 500,339

Claims priority, application Germany, July 17, 1972, 2235036; Jan. 25, 1973, 2303552

Int. Cl.² B61B *13/08*

U.S. Cl. 104—148 LM **13 Claims**



1. In a levitation-type vehicle system comprising a track and a vehicle displaceable along a path on said track, said vehicle including at least two of the elements (a) to (e), said elements being (a) electromotor means for propelling said vehicle along said track, (b) electromagnetic suspension means for magnetically supporting said vehicle on said track, (c) electromagnetic guide means for laterally positioning said vehicle relative to said track, (d) contact-shoe means for effecting an electrical connection between said track and said vehicle and (e) emergency support means engageable with said track upon failure of said electromagnetic suspension means, said track comprising a support extending generally continuously along the vehicle path and at least two generally continuous rail members respectively cooperating with said two elements of said vehicle, the improvement which comprises mounting members common to said at least two rail members and anchored to said support at spaced-apart locations along said track, said mounting members comprising combination brackets formed with means for affixing said brackets to said support and means for mounting said rail members on said brackets.

3,937,150

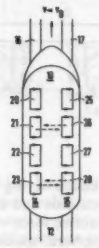
MAGNET SYSTEM FOR USE IN ELECTRODYNAMICLY SUSPENDED VEHICLES

Jürgen Miericke, Nurnberg, and Laxmikant Urankar, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 30, 1975, Ser. No. 545,594

Int. Cl.² B61B *13/08*

U.S. Cl. 104—148 SS **11 Claims**



1. In a magnet system for the contactless guidance of a vehicle moved along a track in which a plurality of magnets are attached to the vehicle and arranged one behind the other in the direction of travel, the magnet system cooperating with nonferromagnetic conductor loops on the track to generate forces according to the electrodynamic principle, the improvement comprising means to change the polarity of an adjacent magnet from a condition where two adjacent magnets have opposite polarities to one where they both have the same polarity.

3,937,151

MINERAL MINING EQUIPMENT

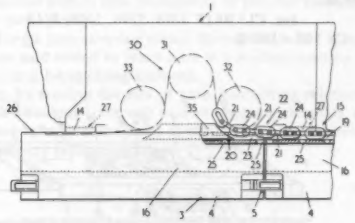
Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, England

Filed Sept. 17, 1974, Ser. No. 506,682

Claims priority, application United Kingdom, Oct. 19, 1973, 48747/73

Int. Cl.² B61B *13/00*

U.S. Cl. 104—172 R **5 Claims**



1. A track member adapted to form part of a track assembly for a mineral mining machine which in use traverses to and fro along a path adjacent to an armoured face conveyor arranged along a mineral face and which has a driven sprocket assembly including a flexible round link chain having adjacent links arranged in two perpendicular planes, comprising an elongated component defining a number of pockets for fixedly engaging those links of the chain lying in one perpendicular plane, the elongated component further defining a continuous groove interconnecting the pockets for accommodating those

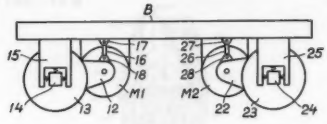
links of the chain lying in the other plane perpendicular to the said one plane.

3,937,152

OSCILLATION SENSITIVE VEHICLE MOTOR CONTROL

Lars-Olof Nilsson; Bo Soderberg, and Fredrik Schmiterlow, all of Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Oct. 18, 1973, Ser. No. 407,508
Claims priority, application Sweden, Mar. 9, 1973, 7303307
Int. Cl.² G08B 21/00
U.S. Cl. 105—61 9 Claims



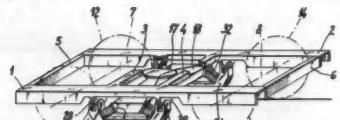
1. In a motor-driven vehicle having at least one drive system which comprises a drive motor and drive wheels;
in which system the tractive force varies with the difference Δv between the peripheral speed of the drive wheel and the speed of the vehicle, in which the tractive force reaches a maximum at a value Δv_2 of said difference and decreases when said difference increases above said value, and in which, when said difference increases above said value, mechanical osciallations occur in the drive system within a certain natural frequency range;
an oscillation sensing member which includes a means to sense mechanical osciallations in the system within such range and to form a signal corresponding to the amplitude of such osciallations;
an arrangement for influencing the torque of the motor; and
means to transmit such signal to said arrangement;
said arrangement including means to reduce partially the torque of the motor in response to oscillations within such natural frequency range.

3,937,153

SWINGING RAILWAY BOGIE BOLSTER

Jean Durocher, Crespin, France, assignor to A.N.F. - Frangeco, Crespin, France

Filed Apr. 24, 1974, Ser. No. 463,600
Claims priority, application France, Apr. 27, 1973, 73.15306
Int. Cl.² B61F 3/08, 5/06, 5/08, 5/12
U.S. Cl. 105—190 R 7 Claims



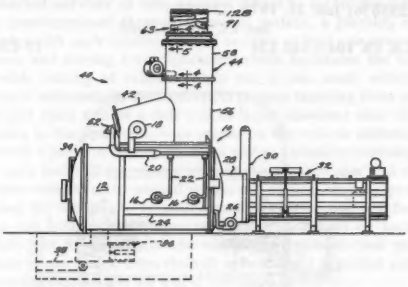
1. A railroad bogie comprising:
a bogie frame having a longitudinal axis and a transverse vertical mid plane;
wheels connected to said frame;
cradles pivotally suspended from said frame with each cradle having a long dimension that is positioned in a longitudinal direction with respect to said frame and each cradle having its long dimension positioned symmetrically with respect to said mid plane;
a bolster rocker beam supported within said cradles with the rocker beam in its rest position in substantial alignment with said mid plane;
said rocker beam having diverging side surfaces with each side surface making a uniform angle with said mid plane when the beam is in its rest position;
each of said cradles having a pair of diverging support surfaces with the support surfaces being substantially parallel to said side surfaces with the beam in its rest position;
spring means positioned between each support surface and each of said side surfaces;
each of said spring means having an end in contact with a support surface and another end in contact with a side surface;
each of said spring means having an axis which is inclined inwardly toward said mid plane from the support surface in contact with the spring means;
each cradle supporting a pair of spring means, and
the axes of each pair of spring means supported by each cradle being in substantial longitudinal alignment,
whereby each spring means undergoes cooperative movement with the other spring means in each pair of spring means in absorbing compressive stress, shear stress of torsional stress resulting from movement of the bolster beam away from its rest position.

3,937,154

AFTERBURNER APPARATUS FOR INCINERATORS OR THE LIKE

Carroll T. Hughes, Jr., Richmond, Va., assignor to Consumat Systems, Inc., Richmond, Va.

Filed Aug. 28, 1974, Ser. No. 501,444
Int. Cl.² F23G 5/12
U.S. Cl. 110—8 A 20 Claims



1. An incinerator for disposing of waste material comprising:
a main combustion chamber for receiving and burning of waste material;
a secondary combustion chamber operatively connected to said main combustion chamber for receiving exhaust gases therefrom and burning waste products in the exhaust gases to produce substantially pollution-free flue gases, said secondary combustion chamber having a pressure burner therefor with a burner nozzle therein at least for assisting in the starting of the burning of waste products in the exhaust gases;
stack means operatively connected to said secondary combustion chamber for receiving flue gases therefrom and discharging the same to atmosphere;
and means for supplying air under pressure into said secondary combustion chamber to assist in the support of combustion therein, said last-mentioned means including means for at least heating the air by heat transferred from flue gases downstream of said secondary combustion

chamber prior to entry of the air into said secondary combustion chamber, said air supply means including a blower and said means for heating said air including a passageway in said stack means operatively connected to said blower and discharging into said secondary combustion chamber at discrete openings;

at least a first portion of said stack means adjacent said secondary combustion chamber being refractory lined, said secondary combustion chamber being refractory lined, and at least another portion of said stack means downstream of said first portion including three annular walls comprising an outer wall member, an intermediate wall member, and an inner wall member, the intermediate wall member and the inner wall member being heat transfer members and the three wall members defining a portion of said passageway for air under pressure, the other portion of said passageway being defined by individual passages through said refractory lined first portion of said stack means terminating in said discrete openings in said secondary combustion chamber.

3,937,155

COMBUSTION FURNACE PARTICULARLY FOR BURNING REFUSE

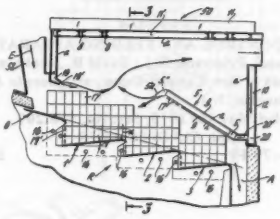
Hans Kunstler, Eulenweg 25, 8048 Zurich, Switzerland

Filed Oct. 8, 1974, Ser. No. 513,073

Claims priority, application Switzerland, Oct. 8, 1973, 14295/73

Int. Cl.² F23G 5/00; F23B 1/22

U.S. Cl. 110—18 R **9 Claims**



4. A combustion furnace particularly for burning refuse, comprising a furnace housing having an inlet adjacent one end for the infeed of material to be burned and a discharge spaced from said inlet, and a grate extending between said inlet and said discharge and having an overall sloping angle sloping downwardly to said discharge, said grate including a plurality of separate individual grate step portions arranged one after the other between said inlet and said discharge and each sloping downwardly in a direction opposite to said overall slope of said grate, said housing including spaced inner and outer walls and an intermediate partition arranged in substantially parallel relationship and defining an inflow passage for air between the intermediate wall and the inner wall from the top of said furnace along each side, said inflow passage having openings into said furnace in the vicinity of said grate and the space between said partition wall and the outer wall defining a return conduit communicating with the end of said inflow conduit for the outflow of the air which is in excess of that required for combustion.

3,937,156

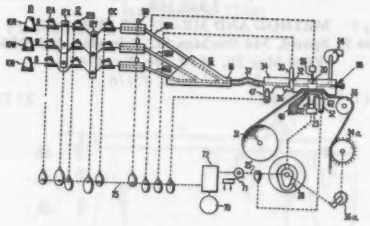
METHOD AND MEANS OF TUFTING

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540

Continuation of Ser. No. 239,931, March 31, 1972. This application Nov. 27, 1973, Ser. No. 419,417

Int. Cl.² D05C 15/16

U.S. Cl. 112—79 FF **29 Claims**



1. In a tufting machine having at least one bit-applying element, pneumatic means including at least one passageway for flow of gas therethrough to deliver a strand of yarn to said bit-applying element, said passageway having a first part shiftable relative to a second part, the method of tufting, comprising the steps of:

applying a flow of gas to said yarn strand to move said strand through said passageway;

shifting said first part of said passageway relative to said second part of said passageway to provide an access opening;

applying a yarn-severing means through said access opening to cut said strand; and

closing said access opening by relative shifting of said first part of said passageway relative to said second part of said passageway to render effective said flow of gas.

16. In a tufting machine having bit-applying elements, pneumatic means including passageways for flow of gas therethrough to deliver strands of yarn to said bit-applying elements, said passageways extending to said bit-applying elements respectively, said passageways having a first part shiftable relative to a second part, the method of tufting comprising the steps of:

transporting yarn strands by pneumatic means through passageways to a loading position with respect to bit-applying elements;

shifting a first part of each of said passageways relative to a second part of that passageway to provide an access to the passageway;

operating a yarn-severing means through each said access to sever said strand to leave a bit in a loading position relative to a bit-applying element;

tufting by moving the bits of yarn into tufting relationship with a backing layer with said bit-applying elements; and

clearing tufts from the paths of said bit-applying elements in their next tufting operation.

3,937,157

METHOD AND MEANS OF TUFTING

Abram Nathaniel Spanel, Princeton, N.J., and David R. Jacobs, New Canaan, Conn., assignors to Abram N. Spanel, Princeton, N.J.

Filed May 29, 1974, Ser. No. 474,264

Int. Cl.² D05C 15/16

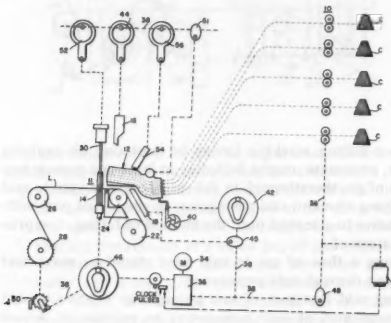
U.S. Cl. 112—79 FF **25 Claims**

1. Tufting apparatus including bit-applying means for applying tufts to a backing layer wherein the improvement comprises:

metering means utilizing rotatable yarn feed means to provide predetermined lengths of yarn;

driving means engageable with a surface of said rotatable yarn feed means;
braking means engageable with a surface of said rotatable yarn feed means wherein said rotatable yarn feed means is always in engagement with either said driving means or said braking means; and
pneumatic means to transport the yarn to a tufting station.

3,937,158
METHOD AND MEANS OF TUFTING
Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540
Filed May 29, 1974, Ser. No. 474,265
Int. Cl.² D05C *15/16*
U.S. Cl. 112—79 FF **23 Claims**

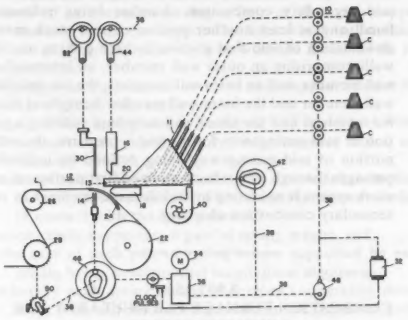


20. A tufting machine for forming tufts with respect to a backing comprising:
tufting-needle means reciprocable between a threading position and a tufting position;
threader tube assembly means for each tufting needle means, each threader tube assembly means including a plurality of yarn passageways through each of which may be transported a yarn strand;
mechanism for reciprocating said threader tube assembly means relative to said needle means;
pneumatic means associated with said threader tube assembly means for transporting yarn strands via said threader tube assembly means into said tufting-needle means when in said threading position;
control means for said threader tube assembly means to select a desired passageway through which to transport a yarn strand into said tufting needle means;
strand severing means;
means operating said strand severing means to sever said yarn strands; and
means for reciprocating said tufting-needle means for applying said severed yarn strands to the backing to form tufts.

3,937,159
YARN CLAMPING MEANS FOR TUFTING APPARATUS
Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540
Filed May 29, 1974, Ser. No. 474,266
Int. Cl.² D05C *15/16*
U.S. Cl. 112—79 R **20 Claims**

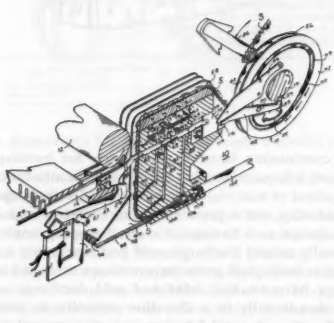
1. Tufting apparatus for the production of tufted products comprising:
bit-applying elements for applying yarn to a backing layer to form tufts;
means for advancing yarn to said bit-applying elements;
clamping means, including a yarn engaging surface for preventing any substantial longitudinal movement prior to tufting of the yarn relative to said bit-applying elements whenever said clamping means engages said yarn, said clamping means further including resilient means disposed as a part of said clamp means; and
means for disengaging said clamping means at desired times during the tufting cycle.

10. Tufting apparatus having tufting stations at which pairs of needles are utilized to apply yarn to a backing layer, including yarn clamping means comprising:



a bit clamp for each individual tufting station, each said bit clamp being aligned between the two needles of each pair and operable to clamp yarn against said backing layer;
a clamping bar including a cantilever portion, said clamping bar being positioned adjacent said bit clamps with said upper cantilever portion extending over said bit clamps;
resilient means extending between said bit clamps and said cantilever structure of said carrier bar; and
lifter bar means to overcome the bias of said resilient means and disengage said bit clamps.

3,937,160
YARN CONTROL AND FEEDING APPARATUS
Abram N. Spanel, Princeton, N.J.; David R. Jacobs, and David N. Buell, both of New Canaan, Conn., assignors to Abram N. Spanel, Princeton, N.J.
Filed May 16, 1975, Ser. No. 578,209
Int. Cl.² D05C *15/18*
U.S. Cl. 112—79 FF **24 Claims**



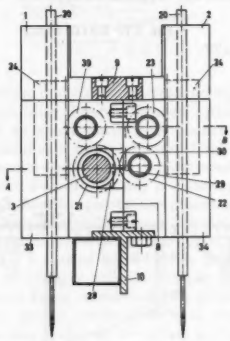
1. Tufting apparatus including bit-applying means for applying tufts to a backing layer at a tufting station comprising:
a metering means utilizing a controlled yarn feed means for advancing a yarn strand;
means including pulsed control means for controlling the yarn feed means to feed a predetermined length of the yarn strand; and
pneumatic yarn transporting means to advance the yarn strand to the tufting station.

17. A tufting machine comprising:
a yarn source;
a yarn metering and feeding means;
a yarn pullback means which enables yarn previously fed to be returned to a standby position, said pullback means being pneumatically actuated;
a pneumatic yarn transport means;
control means for actuating said yarn metering and feeding means, said yarn pullback means, and said pneumatic transport means;
yarn severing means; and
tufting elements to tuft said severed yarn.

3,937,161
EMBROIDERY MACHINE

Rudolf Reich, An der Ringstr. 6, 545, Neuwied, Germany

Filed July 3, 1974, Ser. No. 485,463
Claims priority, application Germany, July 5, 1973, 2334134; Jan. 23, 1974, 2403167
Int. Cl.² D05C *3/04*
U.S. Cl. 112—83 **33 Claims**

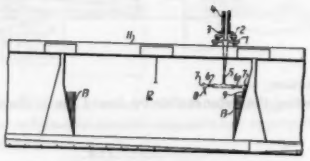


1. An embroidery machine including at least one embroidery station, each such station having at least one universal embroidery head, each universal head accommodates on the needle side thereof a plurality of embroidery station elements including needles, piercers, fabric pressures, yarn catchers and front yarn knives;
means coupled to said elements for adjusting said elements vertically and horizontally over an embroidery field;
a basic guide;
each universal head comprises two individual heads (1,2) associated with said elements;
means for selectively arranging said individual heads, together with their corresponding elements, on said guide side by side, staggered, or steplessly relative to each other, whereby said elements are adapted to become selectively coupled and decoupled individually, in groups, or all together; and
driving means including mechanical means for driving at least some of said elements in said embroidery station.

3,937,162
DEVICE FOR USE IN DEMOLISHING A CONSOLIDATED AND HARDENED SLURRY BODY REMAINING IN THE HOLD OF AN IRON-ORE CARRIER

Mitsuo Fukutani, Nagasaki, Japan, assignor to Kobe Steel Ltd., Kobe and Mitsubishi Heavy Industries, Ltd., Tokyo, both of, Japan

Filed Apr. 12, 1973, Ser. No. 350,591
Claims priority, application Japan, Apr. 12, 1972, 47-36631
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 R **7 Claims**



1. For use in the wet-loading and dry-unloading of an iron-ore carrier which is loaded with iron-ore in a slurry state in its hold, a device for demolishing, by using reciprocal movement, a consolidated and hardened slurry body remaining in the form of a wall along the side walls of said hold comprising:
a first platform mounted on the opposing edges of a hatch opening of said hold capable of moving longitudinally of said carrier;
a second platform mounted on said first platform being movable laterally of said carrier;
a turning means mounted on said second platform and being turnable about an axis perpendicular to said platforms through a given angle;
an outer cylinder mounted on said turning means in parallel relation with said axis of turning and turnable therewith and having an inner cylinder extensible therefrom vertically downward into said hold and retractable relative to said outer cylinder; and
arm members being extensible from and retractable toward said inner cylinder solely in a horizontal plane and attached to the lower end thereof extending in horizontally opposite directions therefrom, and provided with a pair of demolishing edges disposed substantially perpendicular thereto at opposite ends thereof, respectively, one of said edges having a configuration corresponding to the corners of said hold while the other one of said edges has a configuration corresponding to the flat sidewalls of said hold whereby said edges may be utilized alternatively in demolishing portions of said slurry body remaining within said corners of said hold and along said sidewalls of said hold as a result of selective rotation of said turning means.

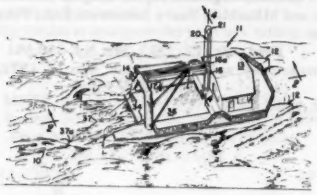
3,937,163
LAUNCH AND RECOVERY VESSEL

Edgar N. Rosenberg, 6914 Mission Gorge Road, San Diego, Calif. 92120

Filed Jan. 31, 1975, Ser. No. 545,947
Int. Cl.² B63C *1/12*; B63B *35/40*
U.S. Cl. 114—43.5 UC **13 Claims**

1. A method of docking and recovering a submersible by a surface vessel comprising:
positioning the submersible within a downward projection of a well provided in the surface vessel;
securing the distal end of a cable to the submersible;
connecting the bitter end of the cable to a two-for-one hydraulic-ratchet purchase;

lifting the submersible through the water-air interface by the cable as the submersible responds to surface wave



action; and

hoisting the submersible on board the surface vessel.

3,937,164

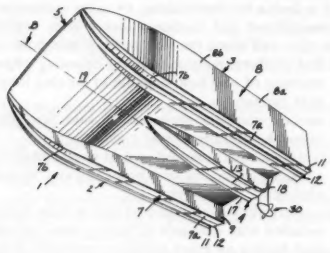
HIGH SPEED WATER CRAFT APPARATUS

Thomas M. Austin, Fargo, N. Dak., assignor to Austin Aeromarine, Inc., Fargo, N. Dak.

Filed Nov. 20, 1974, Ser. No. 525,406

Int. Cl.[2] B63B *1/20*, *1/38*

U.S. Cl. 114—66.5 R 6 Claims



1. A high-speed water craft, said craft being generally symmetrical about a longitudinal vertical plane extending along the craft centerline, said craft comprising:

a. two symmetrically disposed hulls for supporting the craft on the water without the need for submerged hydrofoils, each of said hulls including a streamlined front portion, exterior and interior side surfaces, and a bottom running surface, said running surfaces having a planar aft portion upon which the craft rides and an upwardly curving streamlined front portion, said aft portions bounded by an outside lateral edge defining a base plane which is generally parallel to and adjacent the water surface when the craft is moving forward;

b. a body structure having a bottom surface carried between said hulls for supporting a superstructure and passenger compartment; and

c. said body structure bottom surface having a curved longitudinal profile, each point on said bottom surface being spaced apart from said base plane to form a tunnel-like opening beneath said body structure; said curved surface defining a venturi chamber in the tunnel beneath the craft for creating aerodynamic forces on the craft when it is propelled forward in the water to elevate and stabilize the craft without the need for submerged hydrofoils, said venturi chamber partially enclosed by the interior surfaces of said hulls and the water surface upon which the craft rides; said bottom surface having a generally unbroken forward surface portion which essentially spans the entire distance between said hull interior side surfaces to form a frontal opening into said venturi tunnel, said forward portion being inclined rearwardly and downwardly toward said base plane to form a constricted throat-like opening in said venturi tunnel, said frontal portion adjoining a rearwardly disposed intermediate surface portion which slopes rearwardly and upwardly away from said base plane to form an enlarged expansiontype opening in said venturi tunnel; said intermediate portion adjoining a rearwardly disposed aft surface portion which slopes rearwardly and downwardly toward said base plane; said aft surface portion having an aft edge generally adjoining said hull interior surfaces to form at least one exit opening from said venturi tunnel; said aft edge being positioned above said base plane a distance at least equal to 60% of the distance between said base plane and said forward surface portion at the constricted opening; said venturi tunnel tending to form a cushion of moving air beneath the craft as it is propelled forward for partially elevating it above the water surface and for providing stability to the craft without the need for submerged hydrofoils.

3,937,165

CONSTRUCTION OF BRIDGE DECKING AND LIKE STRUCTURES

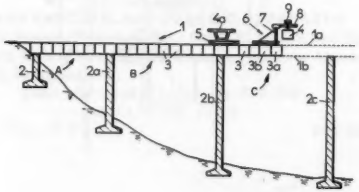
Pierre Armand Maurice Thivans, Chevreuse, France, assignor to Campenon Bernard Europe, Paris, France

Filed Sept. 20, 1974, Ser. No. 507,950

Claims priority, application France, Sept. 21, 1973, 73.33961

Int. Cl.[2] E01D *19/02*

U.S. Cl. 14—77 8 Claims



1. In a "step-by-step" method for the construction of a segmental span structure, in which a plurality of modules having a transverse dimension equal to the width of the span structure and a length substantially less than said transverse dimension, are mounted in succession at the end of a cantilever span section disposed between successive supporting pillars, the improvement comprising the steps of (a) displacing a module along the cantilever span section with said transverse dimension of the module parallel to said span section, up to a stand-by position adjacent an end edge of the cantilever span section; (b) lifting the module; (c) pivoting the module by a quarter of a turn over said end edge about a substantially vertical axis located between a side edge of the cantilever span section and the module in said stand-by position, to bring the module in outboard position with the transverse dimension of the module parallel to said end edge; and (d) lowering the module from said outboard position to an erection position engaging said end edge.

3,937,166

FLOAT CONNECTION ASSEMBLIES FOR MULTI-HULLED BOATS

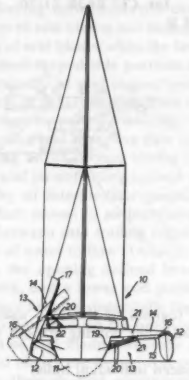
Ian Lindsay, 122 Barton Road, Hawthorne, Queensland, Australia

Filed Oct. 7, 1974, Ser. No. 512,246

Claims priority, application Australia, Oct. 9, 1973, 5154/73

Int. Cl.[2] B63B *43/14*

U.S. Cl. 114—123 9 Claims



1. A variable beam multi-hulled boat including a main float, a retractable stabilising float in spaced apart side-by-side relationship and an above-water float connection assembly adapted to maintain said floats in parallel side-by-side relationship, said assembly including a support beam fixed to said stabilising float and a pivot assembly connecting said support beam to said main float for pivotal movement with respect to said main float about a longitudinal axis to enable said stabilising float to be retracted towards said main float, and said pivot assembly including a pair of spaced guide frame assemblies each connected pivotally at opposite ends to said main float and to said support beam respectively for pivotal movement about respective spaced longitudinal axes and said guide frame assemblies being adapted to restrain said support beam for pivotal movement guiding said stabilising float for movement in a substantially horizontal direction towards said main float, to maintain a stabilising relationship with said main float at all times, and there being provided releasable locking means associated with said float connection assembly and operable to maintain said stabilizing float in its extended position.

3,937,167

METHOD FOR UNLOADING AND TRANSFERRING EGGS

William H. Warren, Omaha, Nebr., assignor to Henningsen Foods, Inc., White Plains, N.Y.

Filed Feb. 25, 1974, Ser. No. 445,577

Int. Cl.[2] B66C *23/00*

U.S. Cl. 214—152 8 Claims

1. A method of unloading eggs from a series of successively oncoming trays and transferring said eggs to a conveyor comprising the steps of:

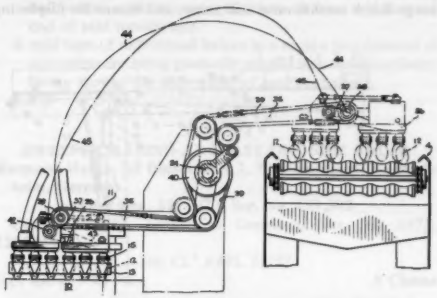
manually moving a tray to a horizontally fixed egg transfer pick-up position;

applying egg carrying means to the eggs in said tray;

operating said means to move said eggs from said tray onto a conveyor while said tray remains in said pick-up position;

then superposing a second tray of eggs on said empty first tray;

applying said egg carrying means to the eggs in said second tray; and



operating said means to move said last named eggs onto said conveyor while said second tray remains superposed on said first tray.

3,937,168

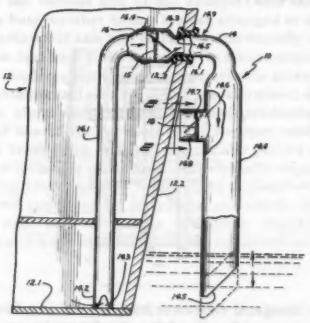
BILGE PUMP

Lyle E. Doak, 30 E. Golden Lake Road, Circle Pines, Minn. 55014

Filed Mar. 17, 1975, Ser. No. 558,914

Int. Cl.[2] B63B *13/00*, *29/16*, *37/00*; F04F *11/00*

U.S. Cl. 114—183 A 8 Claims



1. A bilge pump for pumping bilge gases from a boat and comprising a generally inverted U-shaped length of tubing providing a first leg having an open end for receiving bilge gases from a boat and a second leg having a lower, open end immersable in the water outside the boat, the tubing including an exhaust port spaced above the immersed tubing end, and freely-opening check valve means permitting the flow of bilge gases in the first leg only away from the gas-receiving end when water is receding from the second leg and also permitting the flow of bilge gases through the exhaust port outwardly of the tubing to the atmosphere when water is entering the second leg.

3,937,169

ARRANGEMENT IN CARGO HATCHES ON SHIP WEATHER DECKS

Carl Erik Ingemar Dahlin, Partille, Sweden, assignor to von Tell Trading Co. AB, Molndal, Sweden

Filed Aug. 19, 1974, Ser. No. 498,378

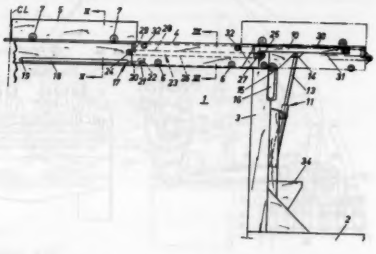
Claims priority, application Sweden, Aug. 20, 1973, 7311290

Int. Cl.[2] B63B *19/12*

U.S. Cl. 114—202 13 Claims

1. An improvement in cargo hatches for ship weather decks including a frame surrounding the hatchway and extending

above the deck, the improvement comprising a ramp juxtaposed to one side of said frame, means for laterally moving a cargo hatch section onto said ramp, and means for displacing



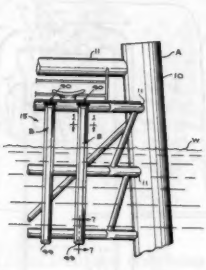
said ramp together with said cargo hatch section for storing said cargo hatch section in a vertical position adjacent said one side of said frame and below the upper level of said frame.

3,937,170

BUMPER GUARD AND ARRANGEMENT FOR WATER COVERED AREAS

Glen E. Drewett, P. O. Drawer 52627, Lafayette, La. 70501

Filed Oct. 29, 1974, Ser. No. 518,354
Int. Cl.² B63B *69/02*; F16F *7/12*
U.S. Cl. 114—219 **30 Claims**



1. An elongated elastomer body for use as a bumper guard in water covered areas and for attachment to a partially submerged structure from above the surface of the water, the body comprising:

a. a base member including:

1. a bottom surface;
2. a pair of side surfaces;
3. a pair of top surfaces extending inwardly toward each other in the same general plane, but terminating at their ends in spaced relation with the combined length of said pair of top surfaces being less than the length of said bottom surface;

b. an upper member including:

1. an upwardly extending surface at the end of each pair of top surfaces of said base member, and terminating at their upper ends in a plane above the plane in which said top surfaces of said base member extend;
2. a surface extending outwardly from the upper ends of each of said upwardly extending surfaces and extending in the same general plane in spaced relation to and overlying said top surfaces of said base member to thereby form a pair of longitudinally extending grooves along each edge of said elongated elastomer body;

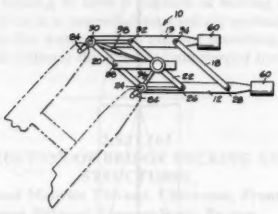
c. reinforcing means in said base member, said reinforcing means including a member which is rigid along the entire extent thereof, said rigid member being disposed between said bottom surface of said base member and said longitudinally extending grooves, the dimension of said rigid member in a direction transverse to said longitudinally extending grooves being greater than the space between said ends of said top surfaces of said base member so that said rigid member overlaps the space between the grooves and extends outwardly of both upwardly extending surfaces defining said grooves.

3,937,171

MULTIHULL TUGBOAT

John K. Seaborn, 6638 Colton Blvd., Alameda, Calif. 94501

Filed July 12, 1974, Ser. No. 488,193
Int. Cl.² B63B *21/56*
U.S. Cl. 114—235 R **13 Claims**



1. A multihull tugboat of the kind used for moving and steering barges and other floating objects, said tugboat comprising:

two laterally spaced individual hulls;

connecting means connecting the hulls for relative longitudinal movement while retaining the hulls parallel;

shifting means associated with said connecting means for shifting the hulls longitudinally to selectively move the prow of one hull ahead of the other hull; propulsion means on each said hull;

an engine in each said hull for driving said propulsion means associated with that hull;

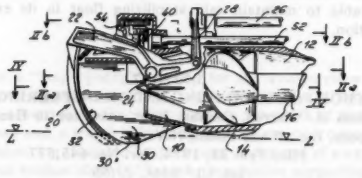
and fender means at the forward end of each hull for engagement with the barge or other object to be moved.

3,937,172

WATER JET PROPELLING APPARATUS FOR BOATS

Luigi Castoldi, 161 Viale Mazzini, 20081 Abbiategrasso, Italy

Filed May 22, 1974, Ser. No. 472,379
Claims priority, application Italy, May 25, 1973, 24624/73
Int. Cl.² B63H *11/00*
U.S. Cl. 115—12 R **8 Claims**



1. In a boat having a bow and a stern and provided with water propelling means including a nozzle adapted to direct a water jet astern of the boat and motor-driven pump means for delivering a stream of pressurized water through said nozzle, a combination comprising steering means including a pair of steerable rudder blades located astern of said nozzle and respectively at opposite lateral sides of the water jet issuing from said nozzle, said blades being pivotable supported in substantial parallel relationship with a given distance therebetween for pivoting movement about substantially vertical axes to either side from a rest position in which said blades extend

substantially parallel to a longitudinal plane of symmetry of said nozzle, said blades having trailing and bottom edges defining openings through which the water jet may pass into the surrounding body of water; reversing gate means having a jet-deflecting surface positioned to face the bow and located astern of said nozzle and being movable about an axis transverse to the lengthwise elongation of the boat, said jet-deflecting surface extending over a wider transversal distance than said given distance and being curved downwardly and forwardly, said jet-deflecting surface comprising a central portion having two adjacent arcuate concave sections extending together substantially over said given distance, each of said arcuate sections having their respective centers of curvature in said vertical axes of said blades and defining clearances with said trailing edges of said blades when the latter are in said rest position, and channel-shaped side portions located symmetrically laterally outwardly of said control portion and forming respective channels of generally U-shaped configuration having curved side edges extending forwardly towards said bow; and means for moving said reversing gate means closely adjacent to said trailing edges of said blades between an upper position in which said jet-deflecting surface does not intercept said jet, a plurality of intermediate positions in which said jet-deflecting surface moves to an increasing extent over the opening defined between said trailing edges of said blades so as to force said jet of water to flow at least in part in downward direction through the opening defined between said bottom edges of said blades, and a lower end position in which said jet-deflecting surface forces substantially the entire amount of said jet of water to flow through the opening defined between said bottom edges of said blades, whereby in said lower end position, when said blades are in said rest position, any water escaping laterally through said clearances is directed forwardly in said channels to enhance the reverse thrust and, when said blades are pivoted, the steering action is not attenuated by any water escaping laterally from the clearance at the side of the boat opposite the desired steering direction.

3,937,173

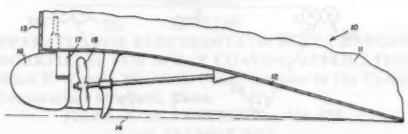
DEEP-V TUNNEL STERN BOAT

Robert B. Stuart, Penn Yan, N.Y., assignor to Penn Yan Boats, Incorporated, Penn Yan, N.Y.

Continuation-in-part of Ser. No. 408,675, Oct. 23, 1973, abandoned. This application Sept. 11, 1974, Ser. No. 504,874

Int. Cl.² B63H *5/16*

U.S. Cl. 115—39 **11 Claims**



1. A boat having a deep-V planing hull with port and starboard sides of the hull bottom inclined upward from the keel line and having a propeller substantially housed in a stern tunnel recessed into said hull bottom to a depth progressively increasing with distance aft from the forward end of said tunnel, said boat comprising:

a. the tops of port and starboard halves of a forward region of said tunnel being generally flat and obtusely angled relative to each other at approximately the angle of said deep-V to meet at said deep-V angle above said keel line;

b. said tops of each of said halves of said forward region of said tunnel each having a constant width of slightly more than the radius of said propeller from the forward end of said tunnel to the region of said propeller so that both the cross-sectional area of said tunnel and the wetted surface area of said tunnel substantially increase gradually with distance aft from said forward end of said tunnel;

c. said tops of said halves of said forward region of said tunnel being inclined upward relative to said sides of said hull bottom with increasing distance aft from said forward end of said tunnel; and

d. said tops of said tunnel halves in a region just forward of said propeller being gradually shaped into a semi-cylinder fitting around the upper half of said propeller.

3,937,174

SWEEPER HAVING AT LEAST ONE SIDE BRUSH

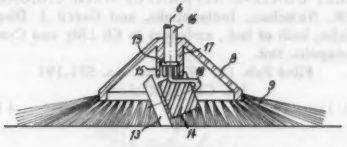
Hermann Haaga, Im Dinkelacker 2, 7000 Stuttgart-Oberturkheim, Germany

Filed Dec. 21, 1973, Ser. No. 427,302

Claims priority, application Germany, Dec. 21, 1972, 2262648

Int. Cl.² A47L *11/32*

U.S. Cl. 15—42 **8 Claims**



1. Sweeper comprising at least one laterally arranged side brush rotatably mounted about a rotational axis inclined with respect to the vertical axis of the sweeper, said side brush including a base member having bristles arranged in a pattern about the rotational axis and extending downwardly and outwardly from said base member, and drive means responsive to the lateral displacement of the sweeper over the surface being swept for rotating said side brush in a predetermined direction of rotation about the rotational axis independently of the direction of lateral displacement of the sweeper, said bristles of said side brush being arranged in a circular pattern and said drive means including roll means for frictionally engaging the surface being swept, said roll means being disposed within the bristle crown and mounted for pivotal movement about the rotational axis, said roll means operatively engaging gear means concentrically disposed about the rotational axis of said side brush.

3,937,175

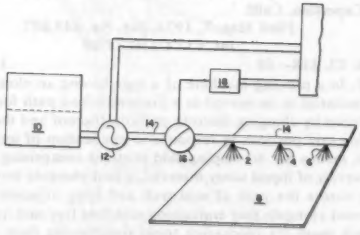
PULSED SPRAY OF FLUIDS

Ellwood J. Horner, Armonk, N.Y., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed Dec. 26, 1973, Ser. No. 427,673

Int. Cl.² B05C *11/00*; B05B *1/08*

U.S. Cl. 118—7 **15 Claims**



1. Apparatus for automatically spraying a liquid on the surface of a moving object comprising, transport means for transporting said object, spray means mounted adjacent the path of travel of said object for spraying an impinging spray of said liquid onto a predetermined area of said surface of said

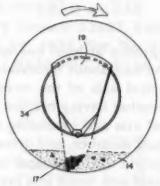
object as said object passes said spray means, distribution line means operatively coupled to said spray means, supply means operatively coupled to said distribution line for continuously supplying said liquid to said distribution line and pulsing means operatively coupled to said distribution line for repetitively and alternately passing said liquid through said spray means for a sufficiently short, first, predetermined period of time to maintain an essentially constant, predetermined pressure on said liquid issuing through said spray means and interrupting the passage of said liquid through said means for a sufficiently long, second, predetermined period of time to build up said predetermined pressure and for repetitively passing said liquid through said spray means at a rate sufficient to deposit a continuous coating of said liquid on said predetermined area of said object.

3,937,176

TABLET COATING APPARATUS WITH UNLOADER

David W. Nicholson, Indianapolis, and Gerrit J. Diepering, Franklin, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 19, 1975, Ser. No. 551,191
Int. Cl.² B05C *3/08*
U.S. Cl. 118—19 **4 Claims**



1. In a tablet coating pan having an opening and a removable gravity discharge unloader chute with an inlet associated with the interior of said pan the outlet of said chute being removably attached to the edge of said pan opening and an outlet exterior of said pan, for rotation therewith, the improvement comprising a substantially truncated conical bottom wall extending between said chute's inlet and outlet for gravity feeding tablets therebetween and having a progressively increasing width toward said outlet and a top surface cooperating with said bottom wall and a pair of side walls to define said chute's opening.

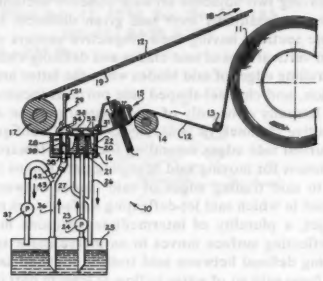
3,937,177

ELECTROSTATIC PRINTING MACHINE WITH IMPROVED TONER FOUNTAIN AND RECOVERY SYSTEM

William A. Lloyd, San Jose, Calif., assignor to Versatec, Inc., Cupertino, Calif.

Filed Mar. 7, 1974, Ser. No. 449,057
Int. Cl.² C23C *13/08*
U.S. Cl. 118—50 **13 Claims**

1. In a printing machine of a type having an elongate web of material to be moved in a predetermined path for printing thereon by charging discrete portions thereof and then developing said portions in response to application of toner material, means for developing said portions comprising a supply reservoir of liquid toner material, a first elongate tray extending across the path of said web and lying adjacent same, a second elongate tray containing said first tray and acting as a catch basin for recovering toner overflowing from said first tray, a pump and connections for recirculating liquid toner material along a path defined from said reservoir to said first tray then overflowing said toner material from said first tray into said second tray and returning said toner to said reservoir, said first tray being disposed at a level serving to carry the overflowing toner material into wetting contact with said web portions to develop same, and recovery means downstream of said first tray for removing toner from said web comprising an elongate, hollow, open top channel member formed to include upwardly extending side walls defining the upstream and downstream side walls of said channel member, the upper end edges of said side walls providing a relatively sharp scraping edge disposed to extend across the path of said web for engaging the undersurface of said web, the edge of the upstream side wall serving to physically remove the main portion of the



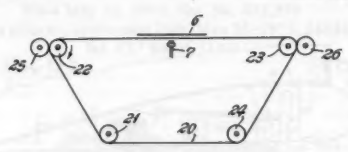
unadhered liquid toner from the web, the edge of the downstream side wall of said channel member serving to physically remove substantially all the remaining toner carried by said web, said channel member including a drain opening therein for withdrawing toner material removed from said web, and vacuum means coupled to said drain opening for recovery of toner from said channel member, said vacuum means including fluid connections between said pump and said drain for applying a suction to said channel member in response to operation of said pump.

3,937,178

FILM INKING SYSTEM

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Filed Oct. 30, 1972, Ser. No. 302,188
Int. Cl.² B05C *1/06*
U.S. Cl. 118—109 **7 Claims**



7. System for providing a continuous supply of liquid ink for transfer to a copy sheet under the effects of imaging pressure comprising a supply of a thin plastic film having an originally ink-free, oleophilic surface and adapted for movement to a transfer position relative to a copy sheet and an imaging element, inking means in advance of said position for applying a continuous thin film consisting essentially of liquid non-drying ink to the oleophilic surface of the plastic film for pressure-transfer from said oleophilic surface to the copy sheet, means for continuously bringing the oleophilic surface of said plastic film into contact with said inking means to provide the oleophilic surface of said plastic film with a continuous thin film of said liquid non-drying ink in advance of the movement of the plastic film into said transfer position, and porous, ink-absorbent de-inking means for removing a substantial portion of the unused ink remaining on said plastic film after said film passes said transfer position and prior to the recontact of the

plastic film with the inking means to receive a new continuous film of liquid non-drying ink.

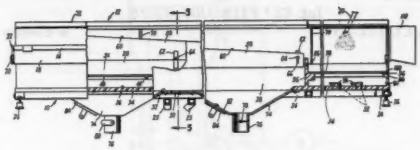
3,937,179
PARTICLE CLOUD COATING METHOD AND APPARATUS

William C. Goodridge, Branford, Conn., assignor to Electrostatic Equipment Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 254,472, May 18, 1972, Pat. No. 3,828,729. This application Mar. 25, 1974, Ser. No. 454,566. The portion of the term of this patent subsequent to Aug. 13, 1991, has been disclaimed.

Int. Cl.² B05B *15/04*; B05C *11/06*

U.S. Cl. 118—301 **17 Claims**



1. In apparatus for coating an object, the combination comprising:

a. fluidized bed means for producing a cloud of particles;

b. means for conveying at least the portion of an object to be coated along a travel path, which travel path is laterally adjacent said fluidized bed means; and

c. mechanical barrier means effectively interposed between said fluidized bed means and said travel path, and including at least a first upstanding baffle spaced laterally to one side of said travel path and extending along at least a portion thereof, said baffle having an elongated edge portion across which particles may readily pass from said cloud to said travel path, said conveyor means and baffle being so disposed relative to one another that said travel path traverses the imaginery, laterally-extending projection surface of said edge portion at a non-perpendicular angle thereto,

so that particles from said cloud may deposit on the object, so as to develop a coating thereon along an axis that is angularly displaced from the axis of said travel path as progressively lower verticle portions of the object horizontally register with said edge portion and thereby become exposed behind said baffle during passage of the object thereby.

3,937,180
APPARATUS FOR ELECTROSTATICALLY CHARGING WORKPIECES FOR SPRAY COATING APPLICATION

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Filed Apr. 10, 1974, Ser. No. 459,470

Int. Cl.² B05B *5/02*

U.S. Cl. 118—635 **4 Claims**

1. Apparatus for transporting workpieces along a predetermined path through a coating zone of uncharged coating particles, including a conveyor structure having

a. a plurality of conductive work supporting elements adapted to support a workpiece and to convey said workpiece along said path;

b. isolating means adapted to provide a nonconductive barrier between selected ones of said supporting means and the remainder of said conveyor structure;

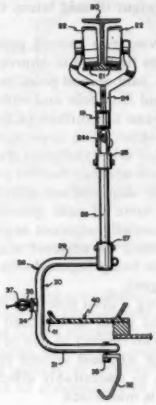
c. charging means adapted to apply a high electrical potential to said selected ones of said supporting means in said coating zone;

d. said charging means including contact means engageable with said support means and forming a progressive charging zone, a high voltage zone, and a discharging zone,

e. said charging zone including a plurality of successively arranged charging contact elements engageable in sequence with work supporting elements being advanced by said conveyor structure,

f. a high voltage charging source,

g. a multiple step voltage divider system connected to said high voltage source and to said charging contact elements, whereby successive such elements are charged at progressively higher voltages for progressive charging of a workpiece being conveyed along said charging zone,



h. said high voltage zone comprising contact means connected to said high voltage charging source and adapted for charging a workpiece to a predetermined high voltage,

i. said high voltage zone being located downstream of the progressive charging zone in the direction of movement of a workpiece carried by the conveyor structure,

j. said discharge zone comprising discharge contact means for grounding workpieces upon exit thereof from said high voltage zone.

3,937,181
MAGNETIC BRUSH TYPE DEVELOPING MECHANISM IN ELECTROPHOTOGRAPHIC COPYING MACHINE

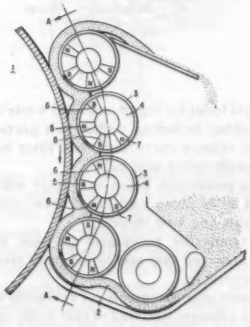
Kenichi Handa, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed May 22, 1974, Ser. No. 472,375

Claims priority, application Japan, May 23, 1973, 48-56866

Int. Cl.² B05B *5/02*

U.S. Cl. 118—637 **1 Claim**



1. A magnetic brush developing apparatus for developing a latent image on a light sensitive member with toner, said apparatus comprising

a plurality of rotatable developing rolls successively disposed adjacent said light sensitive member, all said rolls being rotated in the same direction;

a plurality of fixed cylindrical magnets respectively disposed within said rolls to effect movement of said toner between said light sensitive member and said developing rolls;

each said magnet having a first pole directly opposed to the surface of said light sensitive member where the polarity of each first pole is opposite to that of adjacent first poles so that the development of said latent image is emphasized;

each said magnet having two second poles of a polarity opposite to that of its first pole to improve the transportability of said toner, said second poles being disposed on opposite sides of said first pole and within a developing region defined between the surface of the light sensitive member and an imaginery line approximately extending through the centers of said cylindrical magnets, the angle between said first pole and said second poles being maximized to improve the development effected by each said first pole, at least some of said second poles of each magnet being substantially adjacent second poles of opposite polarity disposed on adjacent magnets, only said first and second poles being disposed with said developing region for each magnet;

each said magnet having a third pole of a polarity opposite to that of its second poles so disposed outside of said developing region with respect to one of its second poles that the tendency of adjacent second poles of adjacent cylindrical magnets to undesirably affect the transportability of the toner is minimized

whereby the combination of said first, second and third poles of said cylindrical magnets tends to maximize both development of the latent image and transportability of the toner.

3,937,182

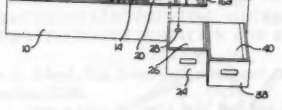
PET TOILET

Minako Kamimura, 8-19-5 Minami-Koiwa, Edogawa, Tokyo, Japan

Filed Apr. 5, 1974, Ser. No. 458,174

Int. Cl.² A01K *29/00*

U.S. Cl. 119—1 **3 Claims**



1. An indoor pet toilet for liquid and solid waste comprising:

a belt-like member including a filter belt portion which is mounted for relative movement, said filter belt having a grip to manually move said belt;

a tray which is positioned below said filter belt and which is so sloped as to guide said liquid from said filter belt toward at least one hole therein;

at least one removable receptacle for said liquid waste which is so arranged that said liquid from said tray pours into said receptacle;

at least one removable receptacle for said solid waste which is positioned adjacent one wall of said toilet, said receptacle for said solid waste having an opening disposed thereabove so that said solid waste falls into the inside thereof by manually moving said belt-like member, said receptacle for said solid waste and said receptacle for said liquid waste disposed in said toilet such that said receptacles can be selectively removed and replaced; and

a lid member arranged and configured on said toilet adjacent said opening above said receptacle for said solid waste whereby odors are retarded from escaping from said solid waste receptacle.

3,937,183

STEAM GENERATOR

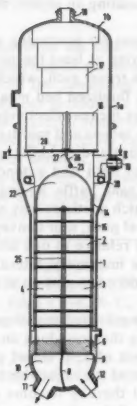
Raimund Reisacher, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Nov. 19, 1974, Ser. No. 525,083

Claims priority, application Germany, Nov. 21, 1973, 2358106

Int. Cl.² F22B *1/06, 37/26*

U.S. Cl. 122—34 **6 Claims**



1. A steam generator comprising a vertical casing having a feed-water inlet and an upper portion forming a steam dome having a steam outlet, said casing forming a portion below said dome, having a tube plate forming a closure and a U-tube bundle having upwardly extending hot and cold legs mounted in said tube plate and a primary header below said tube plate and having primary fluid hot and cold nozzles and a partition for directing primary fluid from said hot nozzle through said hot leg and from said cold leg through said cold nozzle, said tube bundle being circumferentially enclosed by a shroud on top of which a group of water separators extends horizontally above at least substantially the horizontal extent of said tube bundle including both of said legs, said separators being under said steam dome, receiving steam-water mixtures rising from both of said legs inside of said shroud, the shroud and the inside of said casing forming a feed-water descent space to which said separators discharge separated water, said casing containing means for diverting part of the steam-water mixture rising from said hot leg to at least a portion of said separators above said cold leg.

3,937,184

HIGH-PRESSURE STEAM GENERATOR FEED WATER INPUT ARRANGEMENT

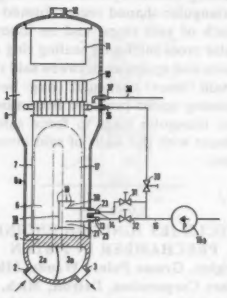
Gerhard Frei, and Heinz-Jürgen Schröder, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 4, 1973, Ser. No. 421,682

Claims priority, application Germany, Dec. 19, 1972, 2262149

Int. Cl. F22b *1/06*; F22d *7/04*

U.S. Cl. 122—32 **4 Claims**



1. A steam generator having a housing provided with a steam output outlet and at least one feed-water input connection, a heat exchanger in said housing converting water therein to high-pressure steam, a source of feed water under a higher pressure than said steam pressure, and a pipe line connecting said source to said feed water input connection; wherein the improvement comprises a flow restricting choke inserted in said feed water input connection, said choke comprising an orifice dimensioned to offer a small flow resistance to the normal input flow through said connection and a comparatively much larger flow resistance to reverse water flow occurring through said connection under said steam pressure in the event said pipe line accidentally opens to the atmosphere, said generator housing containing a feed water preheater formed by walls and to which said connection feeds, said walls being subject to damage by a water flow at a velocity substantially in excess of the normal feed water input flow.

3,937,185

STAGGERED CONFIGURATION FOR WANKEL ENGINE SPARK PLUGS

James R. Dixon, Plymouth, and Charles M. Jones, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sept. 5, 1974, Ser. No. 503,534

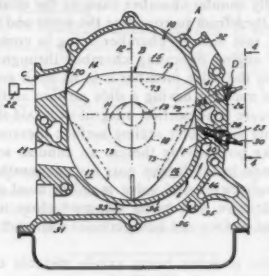
Int. Cl.² F02B *55/10*, *53/12*

U.S. Cl. 123—8.01 **11 Claims**

1. In a rotary internal combustion engine having housing walls defining a trochoidally shaped chamber, an eccentrically mounted rotor for planetary movement in said chamber and cooperating with said housing walls to define a plurality of variable volume chambers into which is introduced a combustible mixture, said engine having spark plugs interposed in said housings walls and having spark terminals for igniting said mixture at a predetermined sequence, the combination comprising:

a. housing means defining a cooling passage along at least one of said housing walls and containing a flowing coolant, that portion of said one housing wall separating said variable volume chambers from said passage having a predetermined section thickness to promote an improved heat transfer rate, said one wall having a gas side and a coolant side, said cooling passage and coolant therein being effective to extract heat from said one wall portion to prevent detrimental housing distortion, and

b. a plurality of bosses extending into said passage for containing said spark plugs and each boss having an axis transverse to the direction of coolant flow, each boss having an upstream side and a downstream side taken with respect to the direction of said coolant flow, the axes



of said bosses being non-aligned with respect to a centerline of coolant flow through said passage and non-aligned with respect to any transverse section of said flow adjacent said bosses, said bosses positioning said terminals in a staggered pattern or approaching an aligned pattern with respect to a centerline of the gas side of said one wall.

3,937,186

ROTARY COMBUSTION ENGINE WITH IMPROVED FUEL CONTROL

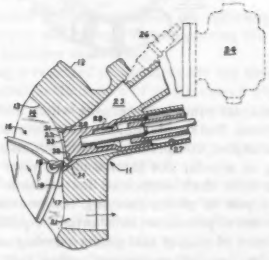
Dieter Stock, Frankenbach, and Johannes Steinwart, Bad Friedrichshall, both of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm and Wankel G.m.b.H., Lindau, both of, Germany

Filed May 23, 1974, Ser. No. 473,091

Claims priority, application Germany, July 5, 1973, 2334183

Int. Cl.² F02B *53/06*

U.S. Cl. 123—8.45 **5 Claims**



1. A rotary internal combustion engine having a housing comprising a peripheral shell with a multilobed inner surface of substantially trochoidal profile and a pair of side walls defining therein an engine cavity, a generally polygonal rotor having a plurality of apex portions rotatably mounted within the engine cavity and defining with the housing a plurality of operating chambers of variable volume, the rotor apex portions sweeping the inner trochoidal surface in sealing relation thereto, the housing having an exhaust port in the region of a cusp of the trochoid and disposed upstream therefrom in the direction of rotor rotation and an intake port in the peripheral shell in the region of the cusp and disposed downstream there-

from, intake passage means in communication with the intake port and serving to provide fuel-air mixture thereto, wherein the improvement comprises:

a. throttling means comprising an elongated valve member extending into said intake passage means and having its longitudinal axis disposed substantially perpendicular to the inner trochoidal surface at the intake port and being slidable along its axis, said intake passage means having a generally annular chamber close to the intake port and outward therefrom surrounding the inner end of the valve member, said annular chamber being in communication with the engine operating chamber through the intake port when the valve member is in its open position;

b. the valve member having a slide portion and at its inner end a closure head portion integral with said slide portion and having an annular sealing surface thereon;

c. the intake port having therein an annular sealing valve seat formed in the intake port for cooperation with the sealing surface of said valve member head portion and with said valve seat being disposed close to the inner trochoidal surface and being coaxial with said valve member; and

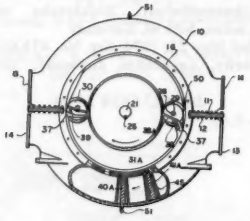
d. said valve member being axially slidable to move its integral head portion axially toward and away from said valve seat so that the intake port is closed when said head portion is in its innermost position against said valve seat and so that a symmetrical annular intake port opening is provided between said head portion and valve seat when the valve member head portion is positioned away from said valve seat.

3,937,187

TOROIDAL CYLINDER ORBITING PISTON ENGINE

Henry Bergen, P.O. Dowa, Dowa, Malawi

Filed Mar. 15, 1974, Ser. No. 451,577
Int. Cl.² F02B *55/14*
U.S. Cl. 123—8.47 **4 Claims**



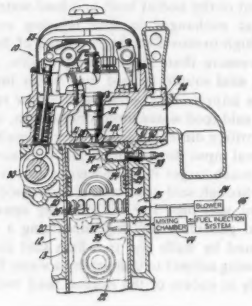
1. An internal combustion engine which includes inlet and exhaust means, fuel supply means and means to ignite said fuel within said engine; comprising in combination a toroidal cylinder having an annular slot formed in the inner circumference thereof, a drive shaft supported for rotation axially of said cylinder, a pair of piston carrying components surrounding said axle, a set of pistons set substantially equidistantly around the perimeters of each of said piston carrying components and mounted for annular movement within said cylinder, said piston carrying components having means sealably engaging within said annular slot, and means co-acting between said shaft and said piston carrying components to control relative movement of each of said piston carrying components with the other and hence the relative position of pistons on one of said piston carrying components and pistons on the other of said piston carrying components, said means coacting between said shaft and said piston carrying components including a sunwheel keyed to said shaft, a ring gear secured around said cylinder adjacent said slot and substantially in the same plane as said sun gear, a plurality of planetary gears meshed with said sun gear and said ring gear, and means to support said planetary gears for rotation, said piston carrying means comprising a pair of rings engaging in said slot, annular sealing means between said rings and further annular sealing means between said rings and the walls of said cylinder defining said slot, said pistons being secured to the outer perimeter of said rings, and means to center said rings concentrically around said shaft and to center said pistons within said torodial cylinder, said last mentioned means comprising an annular recess formed around the walls defining said slot, annular seal pads secured within said recess and an inner annular shoulder formed on each of said rings engageable with said seal pads to center said rings and hence said pistons secured to said rings, said annular sealing means between said rings including an inner annular triangular shaped recess formed on the interfacial faces of each of said rings, and an inner contractually stressed triangular cross sectioned sealing ring engaged within said inner recesses and spanning between said rings, said inner recesses and said inner triangular ring being positioned whereby gas passing under pressure from said cylinder acts upon said inner triangular ring, to force same into further sealing engagement with the walls of said inner recesses with a wedging action.

3,937,188

TWO-CYCLE JET IGNITION ENGINE WITH PRECHAMBER IN PISTON

Clifford C. Wrigley, Grosse Pointe Woods, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 13, 1975, Ser. No. 540,672
Int. Cl.² F02B *19/10, 19/18, 3/00*
U.S. Cl. 123—32 SP **7 Claims**



1. A two-cycle internal combustion engine including means defining a closed end cylinder, a piston reciprocably movable in said cylinder and defining therewith a combustion chamber adjacent said cylinder closed end and variable in volume from a minimum to a maximum upon movement of said piston from top dead center to bottom dead center positions, respectively, a prechamber formed within said piston and connected to said combustion chamber by a restricted passage through the end of said piston, said prechamber being open on one side through a cylinder engaging wall of said piston, exhaust means through said cylinder and open to said combustion chamber near its maximum volume to permit removal of exhaust products from said chamber, first inlet means through said cylinder and open to said combustion chamber near its maximum volume to admit a fresh gas charge directly to said combustion chamber, second inlet means through said cylinder and positioned such that upon movement of said piston to its bottom dead center position, said prechamber communicates through its open side with said second inlet means for supplying a rich charge of air-fuel mixture to said prechamber, and ignition means mounted in said cylinder and positioned such that upon movement of said piston to its top dead center position, said prechamber communicates with said ignition means, for ignition of said prechamber charge, combustion of which causes

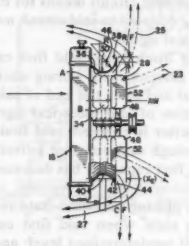
expulsion of burning gases through said restricted passage to said combustion chamber and consequent ignition and burning of the gas charge in said combustion chamber.

3,937,189

FAN SHROUD EXIT STRUCTURE

Harold D. Beck, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Jan. 28, 1974, Ser. No. 437,127
Int. Cl.² F01P *11/10*
U.S. Cl. 123—41.49 **5 Claims**



1. A heat exchange apparatus comprising:

a heat exchange means having front and rear faces;

shroud means operatively connected to said heat exchange means about its rear face, said shroud means including a rearwardly extending exit shroud means comprising a radially outwardly and axially rearwardly extending curved shroud section and a flat portion extending radially outwardly from one end of said curved section;

an axial flow, suction-type fan having a plurality of fan blades, each of said fan blades having a trailing edge and a leading edge, said leading edges lying generally in a first radial plane and said trailing edges lying generally in a second radial plane axially spaced rearwardly from said first radial plane a distance AW and wherein the following relationship within plus or minus 12 percent of AW exists: RF = AW/3 where RF is the radial length of said radially extending shroud flat portion and R = 2AW/3 where R is the radius of curvature of said curved shroud section; and said second radial plane being axially spaced rearwardly from the radial plane containing said radially extending shroud flat portion a predetermined distance (X_E) having a value of more than 50 but less than 100 percent of said axial distance AW.

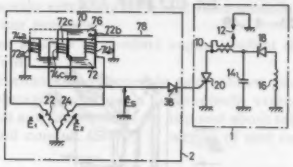
3,937,190

IGNITION TIMING CONTROLLER FOR A BREAKERLESS IGNITION SYSTEM

Mitsuo Katsumata, Numazu, Japan, assignor to Kokusan Denki Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1973, Ser. No. 404,870
Claims priority, application Japan, Oct. 12, 1972, 47-101549; Oct. 19, 1972, 47-120042[U]
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **3 Claims**

1. An ignition timing controller for use in a breakerless ignition system for an internal combustion engine having a flywheel magneto, said controller comprising a semiconductor switching means to control a primary current through an ignition coil and a signal source to supply a control signal to said semiconductor switching means, characterized by that said signal source includes a plurality of signal generators to generate respective signal voltages having different phase angles, a voltage composing means comprising a variable dividing resistor having a dividing terminal, said signal generators at one end thereof being commonly grounded and at the other end thereof connected to the ends of said variable dividing resistor whereby the output voltages of said signal generators may be selectively combined at any ratio of one to another, a signal transformer having a primary side connected to



said dividing terminal of said variable dividing resistor and a secondary side commonly grounded with said primary side and generating said control signal and a diode for applying said control signal to said semiconductor switching means.

3,937,191

ROCKET LAUNCHER INCLUDING REMOTELY RELEASABLE PIN LATCH

Charles J. Green, Vashon Island, Wash., assignor to Estes Industries Inc., Penrose, Colo.

Division of Ser. No. 223,452, Feb. 4, 1972, Pat. No. 3,820,275.
This application Mar. 25, 1974, Ser. No. 454,087
Int. Cl.² F41F *3/04*
U.S. Cl. 12.4—11 R **1 Claim**

1. A toy rocket launcher adapted for refueling a rocket positioned thereon and for remotely triggering the launch of a rocket, said launcher comprising:

a body having a recessed platform on the top thereof and a male member in the recess of said recessed platform for receiving the end of the nozzle of a rocket in said recess and around said male member, said body having a channel communicating between the exterior of said body and the surface of said male member;

a resilient, hemispherical seal member positioned on said male member and having an opening communicating with said channel in said body, said seal member being adapted to sealingly engage the nozzle of a rocket;

means for retentively engaging a rocket nozzle when a nozzle is in sealing engagement with said seal member and for releasing a nozzle in response to movement thereof away from said seal member, said means including a remotely releasable latch pivotally mounted in said body;

said latch and said body having holes positioned to be in alignment when said latch is in retentive engagement with a nozzle;

a pin adapted for engaging the aligned holes in said latch and said body, and;

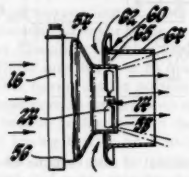
means for extracting said pin from a point remote from said launcher, to release said latch and enable a rocket seated on said launcher to be launched.

3,937,192

EJECTOR FAN SHROUD ARRANGEMENT

Richard E. Longhouse, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 3, 1974, Ser. No. 502,276
Int. Cl.² F01P 7/10
U.S. Cl. 123—41.49 5 Claims



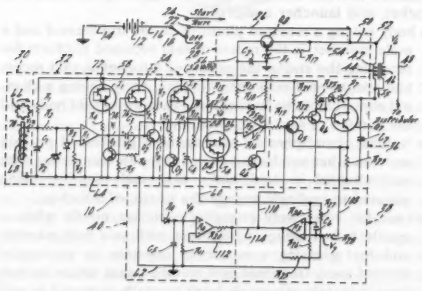
2. An automotive engine cooling means for use intermediate a radiator and an engine, said cooling means comprising a fan having a plurality of fan blades and being operatively connected to and driven by said engine, and concentric inner and outer fan shrouds, each mounted so as to have a portion thereof positioned radially outwardly of said fan with said outer shroud extending a predetermined distance past said fan toward said engine, said outer shroud having a rectangular-shaped face formed on one end thereof and secured to said radiator with the other end thereof being circular-shaped, and said inner shroud having a diffuser formed at the engine end thereof and being secured to said fan blades at the outer tips thereof, the air drawn through said fan and the air entrained through the clearance between said shrouds terminating in an ejector action extending from the engine end of said inner shroud to the engine end of said outer shroud, said ejector action serving to substantially diminish air-flow recirculation around the outer tips of said fan blades to the low-pressure area intermediate the fan and the radiator.

3,937,193

ELECTRONIC IGNITION SYSTEM

Soo Nam Kim, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 19, 1973, Ser. No. 417,443
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 R 12 Claims



11. An ignition system for a spark-ignition internal combustion engine having a direct current potential source and an ignition coil having at least a primary winding coupled to said direct current potential source, said ignition system comprising:

a solid-state switching device connected in series with said ignition coil primary winding, said solid-state switching device having a conductive state permitting current flow through said ignition coil primary winding and having a nonconductive state preventing current flow through said ignition coil primary winding;

means for generating a periodic electrical signal in timed relation to operation of said engine, said electrical signal having a period equal to the ignition cycle of said engine;

a first capacitor for storing electrical charge;

a first constant current source coupled to said first capacitor;

a constant current drain coupled to said first capacitor;

circuit means for supplying electrical charge at a constant rate to said first capacitor from said constant current source for a predetermined fractional portion of said electrical signal, said circuit means for charging said first capacitor being coupled to said circuit means for generating said electrical signal;

circuit means for discharging said first capacitor through said constant current drain during each period of said electrical signal and after the end of said predetermined fractional portion of said electrical signal during which said first capacitor is charged, said first capacitor being discharged through said constant current drain until the charge on said first capacitor has decreased to a predetermined level;

circuit means for placing said solid-state switching device in its conductive state when said first capacitor has discharged to said predetermined level; and

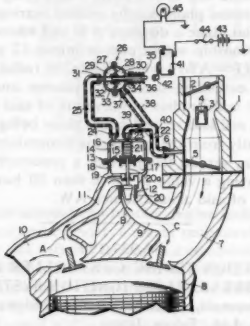
circuit means for placing said solid-state switching device in its nonconductive state at a predetermined point in said electrical signal.

3,937,194

ALARM APPARATUS FOR CIRCULATING EXHAUST GAS FLOW CONTROL DEVICE

Sigeo Tamaki, and Tomoo Itoh, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1974, Ser. No. 445,280
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 A 9 Claims

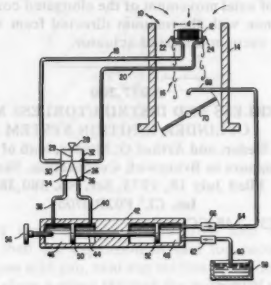


1. An alarm apparatus for a recirculating exhaust gas flow control device, which device is employed in a combustion engine and has an expansible chamber responsive to the intake combustion air pressure and drivingly connected to a recirculation exhaust gas flow control valve for changing the quantity of exhaust gas recirculated in accordance with the intake combustion air pressure of the engine, which alarm apparatus comprises: a housing; a movable member disposed in said housing for dividing said housing into separate opposed first and second alarm expansible chambers; means fluid communicating each of said first and second alarm expansible chambers with said device expansible chamber; means for producing an alarm signal in response to a predetermined movement of said movable member as produced by a predetermined pressure difference between said alarm expansible chambers.

3,937,195
CONSTANT MASS AIR-FUEL RATIO FLUIDIC FUEL-INJECTION SYSTEM

Robert L. Woods, Kensington, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 26, 1974, Ser. No. 500,838
Int. Cl.² F02M *59/10*; G01F *1/32*
U.S. Cl. 123—119 R **9 Claims**



1. In an internal combustion engine having an intake port, the improvement which comprises a constant mass air-fuel ratio fuel-injection system which comprises:

fluidic mass air flow sensor means for producing pressure oscillations in direct proportion to the mass air flow to said engine;

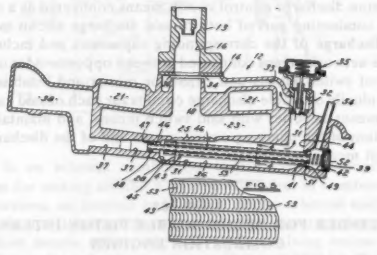
a source of fuel; and

means responsive to said pressure oscillations for delivering a constant amount of fuel from said source to said engine per oscillation cycle.

3,937,196
INTAKE MANIFOLD FOR AN INTERNAL COMBUSTION ENGINE HAVING AN INTERNALLY CONTAINED EXHAUST GAS RECIRCULATION COOLER

Robert R. Cook, Dearborn, and Roy E. Diehl, Northville, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 5, 1975, Ser. No. 547,423
Int. Cl.² F02B *27/00*
U.S. Cl. 123—119 A **16 Claims**



1. An intake manifold for supplying fuel, air and exhaust gases to a V-type multicylinder internal combustion engine having combustion chambers disposed along opposite sides of a longitudinal centerline,

said manifold comprising a casting having an upwardly opening riser passage, a generally horizontal plenum chamber in communication with said riser passage, a set of runner passages extending generally transversely from said plenum chamber, a transversely extending exhaust gas crossover passage,

an exhaust gas recirculation passage extending longitudinally from said exhaust gas crossover passage to means for receiving an exhaust gas recirculation control valve constructed to meter the flow of exhaust gas through said exhaust gas recirculation passage, and a metered exhaust gas passage extending from said valve receiving means to said riser passages,

a coolant passage to conduct engine coolant through the manifold,

a heat exchanger positioned in said exhaust gas recirculation passage comprising a longitudinally extending liquid conduit and finned elements disposed about said conduit,

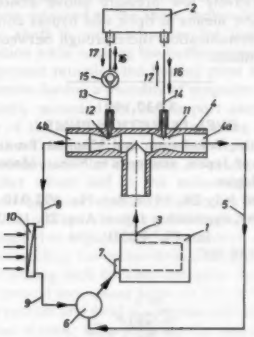
said liquid conduit forming a portion of said coolant passage,

seals means separating said conduit from saidi exhaust gas recirculation.

3,937,197
HEATING MEANS FOR THE INTAKE SYSTEM OF A WATER-COOLED COMBUSTION ENGINE

Wolfgang Bihler, Bad Friedrichshall, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Neckarsulm, Germany

Filed Mar. 18, 1974, Ser. No. 451,774
Claims priority, application Germany, Mar. 22, 1973, 2314250
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 H **3 Claims**



1. A water-cooled combustion engine having a cooling water inlet and a cooling water outlet, a cooling water pump, a first cooling water circuit comprising a first line from said outlet to said inlet and a second cooling water circuit comprising a second line from said outlet to said inlet, a cooler in said first line, a thermostatic valve for closing said first circuit and opening said section circuit when the engine is cold, and vice versa when the engine is warm, the engine having an intake system with a heating means which comprises a cooling water flow chamber having a supply line connected to said first line upstream of the cooler and a return line connected to said second line and a non-return valve to prevent flow of cooling water from said return line through said flow chamber and supply line.

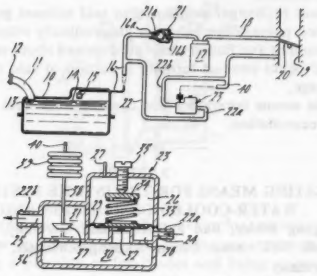
3,937,198
ROLL-OVER VALVE AND VAPOR SEPARATOR

Gopinath Sudhir, Dearborn, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Jan. 24, 1974, Ser. No. 436,287
Int. Cl.² F02D *19/00*
U.S. Cl. 123—136 **10 Claims**

1. In an automobile engine having a fuel tank and an intake manifold for supplying fuel and air to said engine, the combination of vapor storage means, vent conduit means for venting

fuel vapors to said storage means from said tank, said vent conduit means including bypass conduit means for providing a restricted vapor flow path bypassing said storage means, control means for controlling vapor flow through said vent conduit means from said tank comprising valve means in said bypass conduit means movable between open and closed positions, means for normally moving said valve means to said



closed position to close said bypass conduit means, and pressure actuated means responsive only to a predetermined, sub-atmospheric pressure in said intake manifold and a simultaneous vapor pressure in said tank greater than a predetermined comparatively low pressure above atmospheric for moving said valve means to open said bypass conduit means to establish communication therethrough between said tank and intake manifold.

3,937,199

FUEL INJECTION PUMP

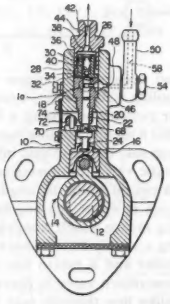
Koichi Takahashi, Yokohama, and Manabu Tsunematsu, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 29, 1974, Ser. No. 492,910

Claims priority, application Japan, Aug. 20, 1973, 48-92405

Int. Cl.[2] F02D *1/04*

U.S. Cl. 123—140 MC **6 Claims**



1. A fuel injection pump of a fuel injection system of an automotive vehicle, comprising a pump shaft rotatable about its axis, a fuel metering unit having a plunger which is axially reciprocally movable in cycles synchronized with the revolution of the pump shaft for discharging fuel in each of the cycles and which is rotatable about its axis for regulating timings, durations and quantities of the discharge of the fuel in said cycles, an elongated control member which is in driving engagement with the plunger and which is axially movable in both directions for driving the plunger to rotate in either direction about its axis, resilient biasing means supported on the elongated control member for biasing the control member in one of said directions, a centrifugal governor responsive to a centrifugal force developed by the revolution of the pump shaft, linkage means engaging the elongated control member and the centrifugal governor for axially moving the elongated control member in the other of said directions against a force of said resilient biasing means, and a vacuum-operated actuator responsive to vacuum in an air intake unit of the engine for bodily moving a one-piece assembly comprising the elongated control member, the resilient biasing means, the centrifugal governor and the linkage means in a direction parallel to the directions of axial movement of the elongated control member in accordance with the vacuum directed from the air intake unit to the vacuum-operated actuator.

3,937,200

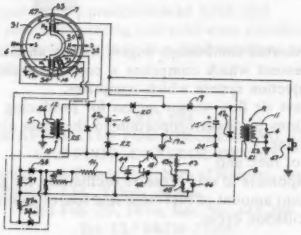
BREAKERLESS AND DISTRIBUTORLESS MULTIPLE CYLINDER IGNITION SYSTEM

Richard L. Sleder, and Arthur O. Fitzner, both of Fond du Lac, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed July 18, 1973, Ser. No. 380,384

Int. Cl.[2] F02P *3/06*

U.S. Cl. 123—148 CC **12 Claims**



1. A capacitor discharge ignition system for a multiple cylinder internal combustion engine comprising a charging circuit connection means providing time spaced opposite polarity signals between a pair of terminal means, a first capacitor means selectively connected to the charging circuit connection means across said terminal means and charged in response to a first polarity signal, a second capacitor means connected to the charging circuit connection means across said terminal means and charged in response to an opposite polarity signal, first and second individual discharge circuit means connected across each of said capacitor means, and a common discharge control switch means connected as a common conducting part of both of said discharge circuit means for discharge of the corresponding capacitors and including diode network means connected between opposite sides of the control switch means and capacitor means and establishing individually operable discharge circuits for each of said capacitor means in series with said switch means, and maintaining isolation of the charging circuit means and of the discharging circuit means.

3,937,201

CYLINDER FOR RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

Hans-Ulrich Howe, Bensberg-Frankenforst, Germany, assignor to Klockner-Humboldt-Deutz AG, Cologne, Germany

Filed Nov. 2, 1973, Ser. No. 412,442

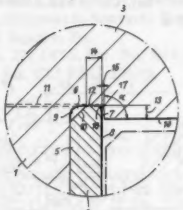
Claims priority, application Germany, Nov. 4, 1972, 2254053

Int. Cl.[2] F16J *1/04*; F02F *1/08*

U.S. Cl. 123—193 CH **1 Claim**

1. A thin wall cylinder for reciprocable piston internal combustion engines, which includes in combination: a top section fixedly connected to said cylinder and provided with a relatively flat annular groove open in the direction toward

said cylinder, a cylinder bushing installed dry into said cylinder without seal and extending in substantially continuous contact with the wall of said cylinder and directly into said annular groove, the inner circumferential surface of said groove defining with that surface of said top section which faces toward the interior of said cylinder an angle in excess of



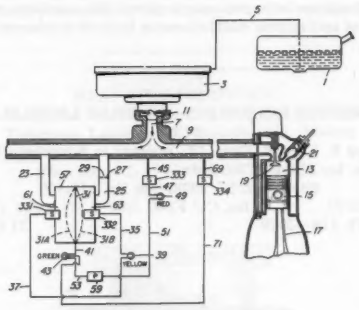
70° with said inner surface spaced from said bushing an amount less than the expansion of said top section in said bushing to close said gap, said top section being connected to said cylinder along a plane through the bottom of said groove along an electron beam weld seam which also includes the end of said bushing in said groove.

3,937,202

ECONOMY DRIVING AID

Donald P. Heath, Union, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 21, 1974, Ser. No. 435,403
Int. Cl.² F02B *33/00*
U.S. Cl. 123—198 R **16 Claims**



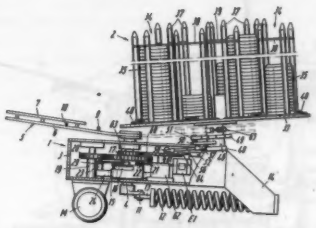
1. In an internal combustion engine system comprising means for mixing air and a hydrocarbon fuel in combustible proportions, an internal combustion engine wherein said air-fuel mixture is burned thereby producing power, and an inlet manifold means connecting said air-fuel mixing means and said internal combutsion engine, said manifold thus allowing for the passage of said air-fuel mixture into said engine, the improvement which comprises: inlet manifold pressure sensing means comprising a chamber divided into two sections by a moveable partition, means connecting each section to said inlet manifold in pressure responsive relation, and restrictive orifice means in one of said connecting means delaying the pressure responsiveness of one of said sections thereby causing said partition to move responsive to a sudden inlet manifold pressure change of at least about 2 to 10 inches of mercury within not more than about 1 second.

3,937,203

SPRING TYPE CLAY PIGEON PROJECTING DEVICE

Eberhard Riedmueller, Blaubeuren, and Horst Klawitter, Sontheim, both of Germany, assignors to Ernst K. Spieth, Sontheim, Germany

Filed Dec. 26, 1973, Ser. No. 428,307
Claims priority, application Germany, Sept. 4, 1973, 2344483
Int. Cl.² F41B *3/04*
U.S. Cl. 124—8 **3 Claims**



3. A trap for clay pigeons comprising a support, a shaft rotatably mounted on the support, a hurling plate attached to the shaft, a crank arm a hurling spring having one of its ends anchored on the support and the other of its ends anchored on the crank arm attached to the shaft, motor-driven means for rotating the shaft in order to move the hurling plate into cocked position while cocking the hurling spring, a triggerable stop arrangement retaining the hurling plate in cocked position, a magazine having a plurality of magazine chambers and being rotatably mounted on the support above the hurling plate, each of the magazine chambers being adapted to receive a stack of clay pigeons, a ratchet wheel connected for common rotation with the magazine, a swivel plate connected to the ratchet wheel and to the motor-driven means and mounted for reciprocal rotational movement about the axis of rotation of the ratchet wheel, a pawl mounted on the swivel plate and adapted to engage the ratchet wheel, a crank mechanism interconnecting the motor-driven means and the swivel plate so that during each cocking operation the swivel plate is put in a reciprocal movement between two end positions and through the ratchet and pawl mechanism rotates the magazine in a step-wise manner so as to bring the magazine chambers successively into a charge position in which each magazine chamber is above the hurling plate in its cocked position, a triggerable mechanism for releasing the lowest clay pigeon of a stack of clay pigeons in the magazine chamber in its charge position, a pressure rod means pivotally mounted on the swivel plate and pivotably against the bias of a spring in response to movement of the swivel plate (so as to extend) to a cocked position to cause a clay pigeon placed on the hurling plate to be moved stop members on the hurling plate prior to projection, and to be out of the path of the clay pigeon dropping from the magazine chamber onto the hurling plate upon triggering of the release mechanism, and means for triggering the release mechanism in timed relation to the reciprocal movement of the swivel plate.

3,937,204

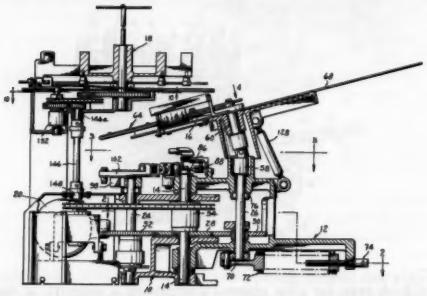
OSCILLATING TARGET THROWING DEVICE WITH ROTARY MAGAZINE ASSEMBLY

James Marion Alday, Williamson, and Kenneth Charles Rowlands, Utica, both of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Nov. 19, 1973, Ser. No. 417,185
Int. Cl.² F41B *3/04*
U.S. Cl. 124—9 **22 Claims**

17. A target throwing apparatus comprising a stationary base member and a main housing member, means pivotally

connecting said housing member to said base member, means oscillating said main housing relative to said base member, a main shaft rotatably mounted on said housing member, crank means secured at one end of said shaft and a main spring connected thereto, a throwing arm secured to the other end of said shaft for throwing targets, means for cocking and throwing said throwing arm by rotating said shaft and crank means secured thereto and utilizing tension of said mainspring, a launching platform mounted on said housing member for supporting a target in the appropriate position until the



throwing arm picks it up and projects it in the proper direction, a magazine attachment mounted on said stationary base member so as to be positioned above said stationary base member and said launching platform, and means for discharging a single target from the magazine to a specific drop point on the launching platform at the desired interval, said drop point being located directly above said pivoting means which connects the pivotal housing member to the stationary base member, said location of the drop point permitting the magazine to remain in a fixed position while the housing and target throwing mechanism are free to oscillate to various positions.

3,937,205

BOW STRING FINGER GUARD

Charles A. Saunders, Columbus, Nebr., assignor to Saunders Archery Co., Columbus, Nebr.

Filed Jan. 24, 1974, Ser. No. 436,158
Int. Cl.² F41B 5/00
U.S. Cl. 124—30 A **4 Claims**

1. A finger guard assembly adapted for attachment to a bow string for protectively cushioning bow-drawing fingers of an archer against objectionable localized finger pressures produced during gripping and pulling of a bow string in drawing a bow, said finger guard assembly including;

two separate flexible and resilient spool-like sleeves each formed with a through longitudinally extending axial bore sized to receive therethrough and thereby frictionally to grip a bow string threaded through said sleeves,

when positioned on a bow string said sleeves being frictionally secured longitudinally of one another on a bow string as upper and lower sleeves, adjacent spaced ends of respective said sleeves generally demarcating an arrow nocking zone therebetween,

said sleeves each being substantially tubular in form with opposite ends of each being radially enlarged annularly to define finger stops, thereby to ensure correct longitudinal positioning of fingers gripping said sleeves and to enhance retention of proper finger positions during drawing of the bow string,

arrow nock abutment means for bracketing and confining an arrow therebetween upon insertion of the arrow nock into the nocking zone between said sleeves, and spacer means interposed between said arrow nock abutment means and said finger stops, adjacent said spaced ends of respective said sleeves to separate said abutment means from said finger stops,

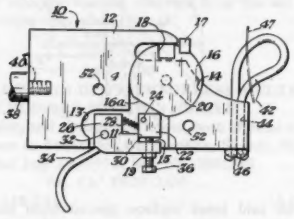
said arrow nock abutment means and said spacer means constituting integral longitudinally coaxial extensions of said sleeves disposed at adjacent said spaced ends thereof to delineate the arrow nocking zone therebetween.

3,937,206

BOWSTRING RELEASE MECHANISM

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Filed Jan. 9, 1975, Ser. No. 539,709
Int. Cl.² A41B 5/00
U.S. Cl. 124—35 A **5 Claims**



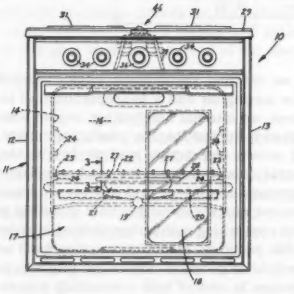
1. A bowstring release device comprising a housing, a bowstring release member rotatably mounted in said housing, a trigger block pivotally mounted in said housing in spaced relation to said release member, a lever secured to said trigger block for manually pivoting said trigger block, a sear pivotally mounted in a space between said release member and said trigger block, shoulder means mounted on said trigger block for engagement by said sear when said trigger block is in a cocked position, spring means connecting said sear and said trigger block and yieldingly urging said sear into substantially constant contact with said release member when the trigger block is in an uncocked position to act against the rotational movement of said release member when said trigger block is in an uncocked position, upon pivotal movement of said trigger block to its uncocked position said shoulder means swings out of contact with said sear to permit the rotational movement of said release member under force of a released bowstring.

3,937,207

RANGE TOP HOLD-DOWN AND PILOT LIGHT FLASH TUBE

Willard E. Kendall, Elgin, Ill., assignor to Winnebago Industries, Inc., Forest City, Iowa

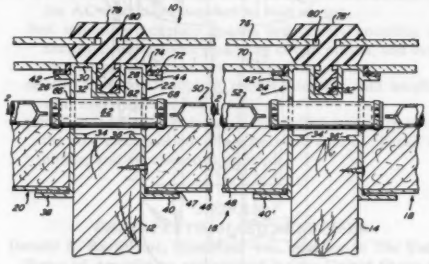
Filed Sept. 30, 1974, Ser. No. 510,509
Int. Cl.² F24C 3/00
U.S. Cl. 126—39 B **21 Claims**



1. An apparatus for holding a top of a gas range having a pilot light burner comprising: a stationary frame located adjacent to the pilot burner, a releasable holding apparatus con-

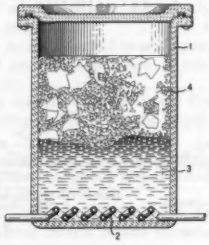
necting the top to the frame, said holding apparatus having a passage open above the top and open adjacent to the pilot burner whereby the pilot burner can be lit with a flame from above the top.

3,937,208
SOLAR COLLECTOR SYSTEM
Howard S. Katz, Green Lane, and P. Richard Rittelmann, Butler, both of Pa., assignors to Sunearth Construction Company, Inc., Milford Square, Pa.
Filed Jan. 20, 1975, Ser. No. 542,535
Int. Cl.² F24J 3/02
U.S. Cl. 126—271 13 Claims



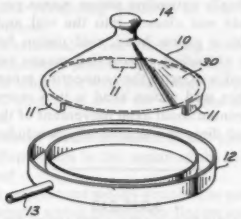
1. A solar collector system comprising a rigid mounting member having a recess on one side for receiving a substructure, first and second solar collectors, said collectors being on opposite sides of said member and partially supported by said member, each collector having an inlet header and an outlet header interconnected by fluid passages, a conduit coupled at one end to a header of said first collector and coupled at its other end to a header of said second collector, said mounting member having openings at a location above said recess, said conduit extending through said openings, and at least one layer of transparent material above each collector partially supported by and sealed with respect to the end portion of said mounting member which is remote from said recess.

3,937,209
HEAT STORAGE DEVICE
James Alden Van Vechten, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 12, 1974, Ser. No. 487,874
Int. Cl.² F24H 7/00
U.S. Cl. 126—375 10 Claims



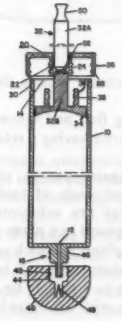
1. Heat storage device comprising a reservoir containing a heat storage medium, means for inserting and extracting heat from said medium, characterized in that
1. said medium is a material whose density in its liquid phase exceeds that in its solid phase,
2. said material has a range of melting temperatures above 100° C and
3. said means for inserting and extracting heat are placed in proximity of the lower end of said reservoir.

3,937,210
CONDENSER LID
John Kachaylo, Los Angeles, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Sept. 3, 1974, Ser. No. 502,514
Int. Cl.² A47J 27/00
U.S. Cl. 126—384 3 Claims



1. A condenser lid assembly for condensing and collecting distilled water when placed on top of a pot containing boiling water comprising
a lid, and
a circular collection rim unit, which may be rested upon the top of an open pot, said rim unit shaped with a pair of concentric walls joined to a common circular bottom section so as to form a circular groove open to the top, with the outer wall of the rim unit fitted with a spout that extends beyond the periphery of the rim unit for the purpose of draining collected condensed water, draining from the lid into the groove, out of said groove and away from a pot of boiling water upon which the assembly is rested.

3,937,211
MULTI-PURPOSE SYRINGE
Utz P. Merten, Cologne, Germany, assignor to Fa. Walter Sarstedt Kunststoff-Spritzgusswerk, Numbrecht, Rommelsdorf, Germany
Filed Oct. 23, 1973, Ser. No. 408,568
Claims priority, application Germany, Oct. 27, 1972, 39445
Int. Cl.² A61B 5/00; A61M 5/00
U.S. Cl. 128—2 F 8 Claims



1. Multi-purpose syringe for extracting a specimen, storing and shipping same and adapted to be employed as a test vial for centrifugation, comprising in combination:

a vial having a wall defining a tubular configuration and a forward and a rearward opening in communication with the interior of the vial;

a nozzle enclosing the forward opening and providing a passageway therefrom adapted for receiving a hypodermic needle;

a cap detachably mounted on said nozzle for sealingly covering said nozzle and the passageway thereof;

an end closure detachably secured to the rearward end of the vial sealingly enclosing the rear opening, and connecting means on said closure extending forwardly into the vial radially spaced from said wall;

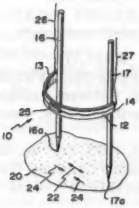
and longitudinally extending piston means projecting a rod through said end closure into the vial and terminating therein with a piston head, said piston head including rearwardly extending connecting means radially spaced from the vial wall, with the connecting means of said end closure when said piston head is in a rearward position whereby unintentional axial movement of the piston head in a forward direction is generally precluded.

3,937,212

MINIATURE MUSCLE DISPLACEMENT TRANSDUCER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cyril Feldstein, Sierra Madre, Calif.; Jules V. Osher, Los Angeles, Calif.; Gilbert W. Lewis, Arcadia, Calif.; Robert H. Silver, Van Nuys, Calif., and Edward N. Duran, Costa Mesa, Calif.

Filed Dec. 27, 1974, Ser. No. 536,761
Int. Cl.² A61B 5/00
U.S. Cl. 128—2 S 7 Claims



1. A transducer for sensing muscle displacement comprising:

a curved beam having first and second spaced apart ends and being of a material having a relatively high degree of elastic compliance;

first and second elongated prongs, physically attached to the first and second ends of said beam respectively, whereby said prongs are substantially parallel to one another and are disposed in a plane which is substantially perpendicular to a plane in which said beam is disposed, said prongs having sharpened ends to facilitate the attachment of said prongs to a muscle by inserting their sharpened ends thereinto, with the beam being in a plane above said muscle; and

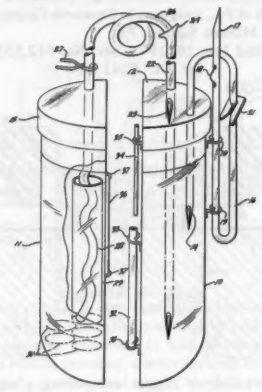
a strain gauge in physical contact with said beam for sensing the deformation of the latter as a result of changes in the linear spacing between said substantially parallel prongs due to muscle displacement.

3,937,213

BODY FLUID COLLECTION DEVICE

Bernard McDonald, 7700 Seville Ave., Huntington Park, Calif. 90255

Filed June 29, 1973, Ser. No. 375,012
Int. Cl.² A61B 5/14
U.S. Cl. 128—2 F 25 Claims



1. A body fluid sampling device comprising:

a rigid collection chamber for initially receiving a complete sample of a body fluid from a patient;

a rigid sample chamber temporarily connected to the collection chamber;

a plurality of evacuated sample tubes in the sample chamber; and

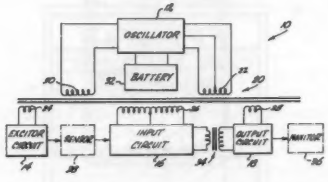
means connected to each sample tube for establishing a selective fluid flow interconnection between the collection chamber and each of the sample tubes, respectively, after collection of the complete sample of body fluid in the collection chamber for dividing body fluid therein into selected aliquots.

3,937,214

ELECTROMEDICAL PATIENT MONITORING SYSTEM

Thomas B. Hutchins, IV, 310 Brynwood Lane, Portland, Oreg. 97229

Filed July 7, 1972, Ser. No. 269,747
Int. Cl.² A61B 5/04
U.S. Cl. 128—2.1 A 2 Claims



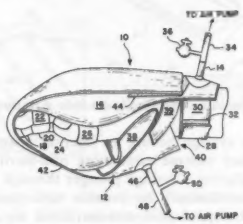
1. In a system comprising a body-contacting-type electromedical sensor for providing body-condition-related information, said sensor having power input means requiring AC excitation, and an electrical monitor for displaying or recording the information, improved apparatus for transmitting said information unidirectionally between said sensor and said monitor, comprising

a battery powerable oscillator,
excitor circuit means inductively coupled to said oscillator for supplying electrical AC excitation to said sensor's power input means,
an amplifier operatively connected to said sensor for receiving information therefrom and for unidirectionally transmitting such information,
powering circuit means inductively coupled to said oscillator for supplying operating power to said amplifier,
a synchronous detector inductively coupled to said amplifier for processing information received from said amplifier, and for supplying it to said monitor,
detector energizing means inductively coupled to said oscillator for energizing said detector in synchronization with the AC excitation supplied to said sensor,
first inductive coupling means inductively coupling said excitor circuit means, powering circuit means, and detector energizing means with said oscillator, and
second inductive coupling means coupling said amplifier with said synchronous detector,
said first and second inductive coupling means providing the sole electrical couplings between said oscillator, amplifier, and synchronous detector.

3,937,215
THERAPEUTIC HAND EXERCISER

Donald E. Barthlome, Hampton, Va., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,487
Int. Cl.² A61H 1/02
U.S. Cl. 128—26 **11 Claims**

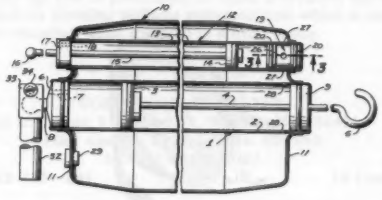


1. A therapeutic hand exerciser comprising:
upper inflatable pouch means which when attached to the fingertips and arm of a disabled individual and inflated has sufficient rigidity to straighten the fingers of the individual, and when deflated is sufficiently pliable to permit the fingers to bend;
first inflation means attached to said upper inflatable pouch means and permitting inflation of said upper inflatable pouch means;
first deflation means attached to said first inflation means and permitting deflation of said upper inflatable pouch means;
fingertip attachment means connected to the underside of said upper inflatable pouch means suitable for holding the fingertips of the individual;
thumb attachment means connected to the underside of the upper inflatable pouch means suitable for holding the thumb of the individual;
arm attachment means connected to said upper inflatable pouch means at the end opposite from said fingertip attachement means and permitting attachment of said upper inflatable pouch means to the arm of said individual;
lower inflatable pouch means which when attached to the wrist of said individual and inflated extends from the palm of the hand of the individual to the wrist portion of the arm of the individual and when deflated is capable of folding such that both ends are approximately at the palm of the hand;
wrist attachment means attached to said lower inflatable pouch means and capable of holding said lower inflatable pouch means onto the wrist of said individual and allowing folding of said lower inflatable pouch means when deflated;
second inflation means attached to said lower inflatable pouch means and permitting inflation of said lower inflatable pouch means;
second deflation means attached to said second inflation means and permitting deflation of said lower inflatable pouch means;
flap means attached to and extending from the end of said lower inflatable pouch means nearest the wrist, with sufficient length for wrapping under the palm, around the extended fingertips, over the knuckles and to the top of the wrist;
flap attachment means attached to and anchoring one end of said flap means in the region of the top surface of the wrist; and
flap length adjustment means attached to said flap means to yield a length which permits the fingers to be straightened when said lower inflatable pouch means is deflated and forces the fingers to bend when said lower inflatable pouch means is inflated.

3,937,216
PNEUMATIC TRACTION MEANS FOR MEDICAL PATIENTS

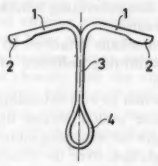
Edmund J. Brown, Topanga, Calif., assignor to Pneumatic Traction Company, Van Nuys, Calif.

Filed Sept. 9, 1974, Ser. No. 504,182
Int. Cl.² A61H 1/02
U.S. Cl. 128—75 **7 Claims**



1. A pneumatic means attachable to a mounting means fixed to a bed or other means supporting a patient for applying a traction force to the patient said traction applying means comprising:
a. a traction unit including a cylinder, piston and stem extending through one end of the cylinder, the traction unit forming a pressure chamber between the piston and end of the cylinder through which the stem emerges;
b. means for attaching the traction unit cylinder to said mounting means;
c. means for attaching the stem to the patient;
d. and means for pressurizing the pressure chamber to apply a traction force urging the stem inwardly to apply tension through the stem to the patient.

3,937,217
INTRAUTERINE CONTRACEPTIVE DEVICE
Ahti A. Kosonen, Pori, Finland, assignor to Outokumpu Oy, Helsinki, Finland
Filed Mar. 8, 1974, Ser. No. 449,245
Claims priority, application Finland, Mar. 19, 1973, 847/73
Int. Cl.² A61F 5/46
U.S. Cl. 128—130 **5 Claims**



1. An intrauterine contraceptive device for placement within the uterine cavity having a normally generally T-shaped configuration with a stem having two outwardly extending arms joined to the stem along a smoothly bent curved portion, said curved portion being flexible, said arms normally extending at acute angles with respect to said stem, said smoothly bent curved portion being bent on a sufficient radius of curvature for prevention of plastic deformation when said arms are bent into general alignment with said stem during loading of the device into an inserter tube, and having a compressible loop at an end of said stem axially remote from said arms for supporting the device on the upper edges of the cervical os, a portion of said stem adjacent said compressible loop being of reduced thickness.

3,937,218
DECUBITUS PAD
John F. Gaylord, Jr., Matthews, N.C., assignor to Medical Specialties, Inc., Charlotte, N.C.
Filed July 29, 1974, Ser. No. 492,890
Int. Cl.² A61B 19/00
U.S. Cl. 128—149 **8 Claims**

1. A protective pad adapted to be positioned on an elbow or heel of a patient and characterized by providing freedom of movement of the limb of the patient and avoiding restricting circulation in the limb, said pad comprising

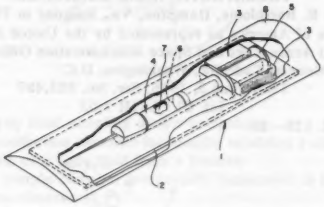
a core of resilient foam material having a generally circular peripheral outline and generally converging concavo-convex cross-sectional configuration such that the concave inner surface defines a smoothly curved elbow or heel receiving pocket having a depth approximating one-half the overall diameter of the core to substantially fully surround and enclose the elbow or heel of the patient therein,

a sheet of fabric smoothly overlying and bonded to each of the concave and convex surfaces of said core,

a pair of spaced apart straps attached to said pad and extending tangentially and in opposite directions from a rear portion of the periphery of said core and with each strap being of a length sufficient to permit positioning of the strap across the core and over the limb of the patient, and

a pair of fastener elements attached to said pad on a front portion of the periphery thereof for releasably securing the end portion of each strap to the front portion of said core, said pair of fastener elements being positioned in spaced apart relation such that the straps may be secured in overlapping crossed relation over the limb of the patient, said straps being thereby adapted to facilitate maintaining the pad in conforming relation on the limb of the patient while allowing free movement of the limb and avoiding constriction of the limb as would reduce circulation therein.

3,937,219
STERILE SYRINGE ASSEMBLY AND METHOD OF MAKING SAME
Nubar A. Karakashian, 539 E. Allegheny Ave., Philadelphia, Pa. 19134
Filed Jan. 14, 1974, Ser. No. 433,118
Int. Cl.² A61M 5/18, 5/31
U.S. Cl. 128—184 **13 Claims**



1. A method for injecting sterile air into a patient including the steps of:

a. providing a syringe having an internal chamber with a predetermined volume containing non-sterilized air by initially displacing a syringe plunger through a predetermined linear distance to provide said predetermined volume quantity of said non-sterilized air within said internal chamber;

b. packaging said syringe in a gas sterilizing enclosure;

c. maintaining said predetermined internal chamber volume when said syringe is packaged in said gas sterilized enclosure by constraining said syringe plunger a predetermined distance from a flange section of a barrel portion of said syringe;

d. sterilizing said enclosure, said syringe, and said predetermined volume through gas sterilization;

e. removing said sterilizing gas from within said enclosure, said predetermined volume quantity of said air remaining within said internal chamber being sterile;

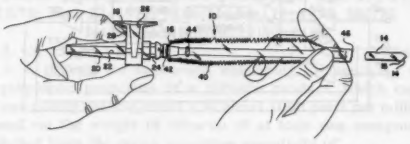
f. taking said syringe from said sterilized enclosure; and,

g. injecting said predetermined volume quantity of said sterilized air contained within said internal chamber into said patient.

3,937,220
STERILE ASPIRATION CATHETER
Nancy Coyne, Jamaica Plain, Mass., assignor to International Paper Company, New York, N.Y.
Filed Mar. 4, 1974, Ser. No. 447,869
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 **1 Claim**

1. A sterile catheter comprising a flexible tube having a fluid flow passageway therethrough and a port at one end thereof, a fluid flow regulator in flow communication with said pas-

sageway, means to receive a fluid pump to effect fluid flow through said regulator and said passageway, said fluid flow being variable by operation of said regulator, a pliable envelope being attached at its end adjacent to said regulator to one of said one end of said tube and said regulator, the other end of the said envelope extending beyond said one end of said



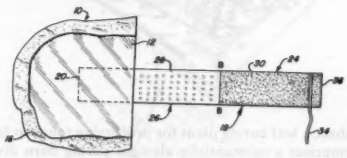
tube and having an opening through which said tube can be ejected, said envelope being freely, slidably retractable along the length of the tube toward said regulator to enable exposure of said tube to an environment outside of said envelope, said envelope having at least one vent hole adjacent to said regulator to enable air within said envelope to escape during retraction of said envelope.

3,937,221

DISPOSABLE DIAPER WITH PERMANENTLY ATTACHED CLOSURE SYSTEM WITH A STRING GRIPPER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed July 18, 1974, Ser. No. 489,643
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **6 Claims**



1. An adhesive tab means for a disposable diaper having an absorbent layer and a moisture-impervious backing sheet at one side thereof which comprises an elongated tape segment permanently attached at one end to said backing sheet at a marginal location thereon and providing a central portion and a free end; a release coating on a surface of said central portion which faces in the same direction as said absorbent layer; an adhesive coating on said free end contiguous to said release coating; and an elongated separator means attached to said free end and extending substantially transversely across and beyond the perimetric limits of said free end; said free end being folded over upon said central portion and being releasably adhered to said release coating, and a portion of said elongated separator means protruding beyond said free end and being adapted for gripping to peel said free end away from said central portion for fastening said diaper about a baby.

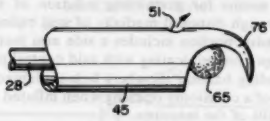
3,937,222

SURGICAL INSTRUMENT EMPLOYING CUTTER MEANS

Anton Banko, Bronx, N.Y., assignor to Surgical Design Corporation, Long Island City, N.Y.

Filed Nov. 9, 1973, Ser. No. 414,221
Int. Cl.² A61B *17/32*
U.S. Cl. 128—305 **20 Claims**

1. A surgical instrument for abrasively removing at least a part of a body organ comprising a shaft having abrasive cutting means at one end thereof, means for rotating said shaft, tubular means surrounding a portion of said shaft and having an end portion for shielding a portion of said abrasive cutting means while leaving a portion thereof exposed to engage the organ, means for adjusting the position of said tubular means longitudinally of the instrument shaft to control the amount of exposure of the abrasive cutting means with respect to the



organ and the space surrounding the organ, said abrasive cutting means being spaced from said tubular means, and means communicating with the interior of said tubular means to remove material which is separated from the organ by said abrasive cutting means.

3,937,223

COMPACTED SURGICAL HEMOSTATIC FELT

Roy William Roth, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 19, 1974, Ser. No. 462,559
Int. Cl.² A61L *15/04*
U.S. Cl. 128—325 **8 Claims**

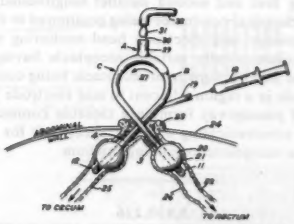
1. A hemostatic surgical felt comprising a sterile felt of fibers of 0.5 to 12 denier and ¼ inch to 3 inch length of a tissue absorbable polymer subject to hydrolytic degradation to non-toxic tissue compatible absorbable components, and which polymer has glycolic acid ester linkages, which felt has a weight of 0.5 ounce to 12 ounces per square yard and textured and partially compressed heat embossed surfaces, whereby the rate of penetration of blood is reduced, and the adhesion to bleeding surfaces enhanced, and which is completely absorbed when enclosed in a living tissue.

3,937,224

COLOSTOMY CATHETER

Ronald L. Uecker, 915 Grant St., Wausau, Wis. 54401

Filed Apr. 11, 1974, Ser. No. 459,892
Int. Cl.² A61M *25/00*
U.S. Cl. 128—348 **12 Claims**



1. An improved diagnostic catheter assembly for use in colostomies comprising:

a. an elongated, generally cylindrical body portion having generally annular walls and a central passage extending from end to end of said body and communicating with openings in said ends;

b. a plurality of sealing balloon members, at least one of which is disposed on said body adjacent each end thereof, and defining a medial portion therebetween;
c. an inflation lumen disposed in association with said body wall communicating with a sealing balloon member, and having means for permitting inflation of said balloon therethrough disposed medially of said balloon;
d. said medial portion includes a side arm member having a passage communicating with said central passage;
e. said sealing balloon members being adapted to provide sealing of a colostomy opening when inflated into contact with walls of the intestine;
f. said side arm member is adapted for connection to fluid conduit means external of a patient's body, and
g. means for selectively forming the medial portion of said catheter into a curved shape and to retain said shape after forming.

3,937,225

ELECTRODE ADAPTED FOR IMPLANTATION

Georg Schramm, Cologne, Germany, assignor to Siemens Aktiengesellschaft, Erlangen, Germany

Filed Feb. 4, 1974, Ser. No. 439,607
Claims priority, application Germany, Feb. 2, 1973, 2305262
Int. Cl.² A61N 1/04
U.S. Cl. 128—418 14 Claims

1. In an electrode for use in effecting the intracardial stimulation of a heart through an implanted heart pacemaker, said electrode comprising an elongate electrical conductor; an electrical insulation encompassing said conductor, an uninsulated generally cylindrical electrode head being connected to said conductor at one end thereof for transmission of stimulating impulses to the heart from the electrode and being mounted on the proximal end of said insulation, means on said electrode for anchoring said electrode head in the heart, and electrical connector means at the distal end of the conductor adapted for connection to a pacemaker, the improvement comprising; said electrode including a continuous elongate hose forming said electrical insulation for said conductor, said hose having first and second parallel longitudinal passageways, said electrical conductor being positioned in the first of said passageways; said electrode head anchoring means including a volumetrically variable receptacle having at least partly elastic wall portions, said receptacle being connected to said electrode in a region adjacent to said electrode head, and said second passageway forming a closable connecting conduit means communicating with said receptacle for filling the latter with a receptacle-expanding medium.

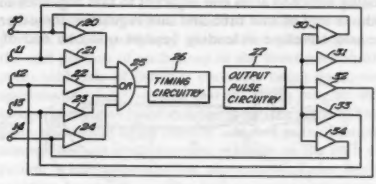
3,937,226

ARRHYTHMIA PREVENTION APPARATUS

Herman D. Funke, Bonn, Germany, assignor to Medtronic, Inc., Minneapolis, Minn.

Filed July 10, 1974, Ser. No. 487,241
Int. Cl.² A61N 1/36
U.S. Cl. 128—419 D 15 Claims

1. Cardiac electrical stimulation apparatus comprising: first means for sensing depolarization at any one of a plurality of areas on a heart; second means for providing cardiac stimulation signals to a plurality of areas on the heart in rapid response to any sensed depolarization by the first means; and means connecting the first means to the second means.

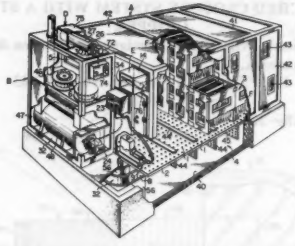


3,937,227

TOBACCO LEAF CURING SYSTEM

Hideyuki Azumano, Kagoshima, Japan, assignor to Sansyu Sangyo Co., Ltd., Kagoshima, Japan

Filed Feb. 28, 1974, Ser. No. 446,766
Int. Cl.² A24B 1/02
U.S. Cl. 131—134 16 Claims



1. A tobacco leaf curing plant for processing tobacco leaves which comprises a substantially air-tight curing barn divided by a porous floor plate into an upper drying chamber adapted to house the tobacco leaves and a lower air chamber, a circulation duct passageway containing fan means and the heating means, an air circulation port means providing communication between one end of the circulation duct passageway and the drying chamber for drawing air from the drying chamber, and a distribution chamber disposed at the other end of the circulation duct passageway, said distribution chamber providing communicatin between said other end of the circulation duct passageway and the lower air chamber for introducing air compressed by said fan means and heated by said heating means into said lower air chamber, an ambient air inlet port provided with an automatic for controlling the amount of ambient air drawn from the atmosphere through the inlet port and introduced into the air circulation duct passageway so as to change the mixing ratio of the ambient air to the circulating air being supplied to the lower air chamber, an automatic temperature regulator connected to the fan means and the heating means and a wet bulb temperature sensor connected to the automatic temperature regulator, said temperature regulator adjusting the heating means according to variations appearing on the wet bulb temperature sensor, thereby regulating and maintaining the temperature and humidity of the air sent to the lower air chamber at a fixed, predetermined level, and an outlet port means disposed in the wall of the drying chamber for exhausting a portion of the air from the drying chamber to the atmosphere, said outlet port means being provided with a control plate associated therewith, and means for opening or closing the outlet port means depending upon the presure differential between the circulating air inside the drying chamber and the atmospheric air.

3,937,228

AROMATIC COMPOSITIONS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich SA, Geneva, Switzerland

Division of Ser. No. 482,776, June 24, 1974. This application June 12, 1975, Ser. No. 586,385

Claims priority, application Switzerland, Jan. 19, 1971, 773/71; June 23, 1971, 9156/71; Jan. 11, 1972, 380/72

Int. Cl.[2] A24B *3/14, 13/00, 15/08*

U.S. Cl. 131—17 R 6 Claims

1. A process for improving, enhancing or modifying the organoleptic properties of a tobacco product, which comprises adding thereto about 1 to about 1000 parts per million based on the weight of tobacco of at least one compound selected from the group consisting essentially of:

a. epoxy-β-ionone
b. 6-methyl-hepta-3,5-dien-2-one
c. 3-isopropyl-cyclopent-2-en-1-one
d. octa-3,5-dien-2-one
e. nonane-2,5,8-trione
f. 2-methyl-5-(α-methyl-α-hydroxyethyl)-cyclohex-2-en-1-one
g. 4-methylthiobutan-2-one.

3,937,229

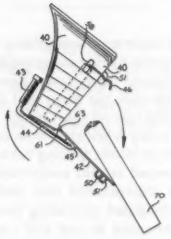
METHOD FOR EXTINGUISHING CIGARETTES AND APPARATUS

Carl Ervine Wickstrom, P.O. Box 83, Emigrant Gap, Calif. 95715

Continuation-in-part of Ser. No. 348,849, April 6, 1973, abandoned. This application Mar. 15, 1974, Ser. No. 451,582

Int. Cl.[2] A24F *13/18*

U.S. Cl. 131—256 10 Claims



8. Apparatus for extinguishing and disposing of cigarettes comprising: chamber means open on one end and having a door on one side, said chamber means being capable of holding a cigarette in substantially a vertical position, means extending through the wall of said chamber means holding said door normally closed, a bi-metallic strip fastened on the interior of one side of said chamber and extending downward in the proximity of the base of said chamber and upward along the other side, and fastened at its other end to said door holding means in such manner so that upon heat being applied to said bi-metallic strip it will lift the door holding means in an upward direction; means on said door movable with relation thereto and in contact with said door holding means and moveable in accordance with upward movement of said door holding means; friction means associated with said means on said door contacting said door holding means such that when there is pressure applied to said door said means holding said door holding means will remain in an upward position when the said door holding means is removed therefrom, in order to allow said door to open; and means to return said door to closed position when it is in the opened position with no other object holding it in the open position.

3,937,230

ELECTRIC HAIRDRESSING IRON

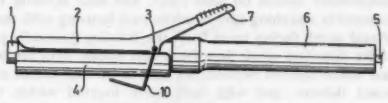
James Edward Kenny, 28 Wolvengracht, Brussels, Belgium

Filed Oct. 4, 1974, Ser. No. 512,221

Claims priority, application Belgium, July 19, 1974, 146764

Int. Cl.[2] A45D *2/24*

U.S. Cl. 132—37 R 5 Claims



1. A hairdressing iron comprising:

a. an elongated rod of a circular cross-section,
b. a first elongated channel of arcuate cross-section coaxial with the rod, said first channel being adjacent said rod and having its inner curved surface facing said rod and its outer curved surface facing away from said rod,
c. means pivotally connecting the first channel to the rod intermediate the ends of the rod, the axis of rotation of the pivotal means being transverse to the longitudinal axis of the rod so that the first channel can swivel from a position adjacent the rod to a position spaced from the rod,
d. means providing a longitudinal groove on the outer surface of the rod on the side of the rod opposed to said first channel,
e. a second channel of arcuate cross-section, said second channel being on the side of the rod opposite to said first channel and overlying the longitudinal groove, and
f. means detachably securing the second channel to the rod, said means comprising an elastic member fixed to the surface of the second channel and dimensioned to be removably captive in said longitudinal groove,
g. said second channel progressively increasing in thickness from both longitudinal edges towards its longitudinal center so that when the second channel is secured to the rod the rod and second channel will have a combined cross-sectional area greater than when the second channel is removed, whereby the hairdressing iron can form wide or narrow waves at the option of the user.

3,937,231

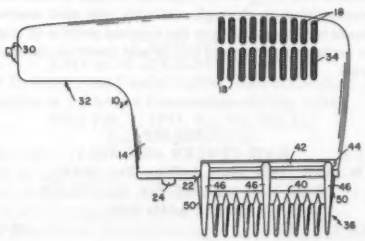
HAIR DRYER

James E. Tucker, and Jay Doblin, both of Chicago, Ill., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 166,550, July 27, 1971, abandoned. This application Oct. 9, 1973, Ser. No. 404,194

Int. Cl.[2] A45D *24/00*

U.S. Cl. 132—11 A 3 Claims



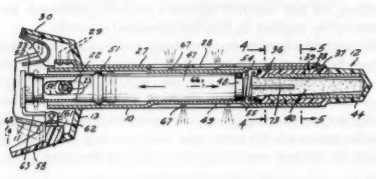
1. A portable hair dryer comprising in combination a dryer housing, said housing defining an air inlet and defining a single air outlet of generally rectilinear shape and of greater length than width, said housing including therein blower means disposed within the housing for drawing a stream of air into the

air inlet, through said dryer housing and out of said outlet, said blower means being aligned with said outlet to cause said stream of air to pass directly from said blower means through said outlet without change of direction; a comb of generally rectilinear shape having a length substantially equal to the length of said outlet and a thickness substantially less than the width of said outlet and being provided with a back and spaced teeth projecting in one direction from said back; and cooperative means on said comb and said housing for demountably attaching said comb to said housing with the teeth of said comb facing away from the housing generally parallel to the direction of air flow from said outlet, with the back of said comb spaced beyond the mouth of said outlet and exposed thereto, and with said comb located within the air stream from said outlet, said cooperative means including bars resiliently supported on said comb and spaced apart both longitudinally and vertically beyond opposite sides of said comb back and extending parallel with said back, and retainer means on said housing at opposite sides of the mouth of said outlet for detachably engaging said bars at the sides thereof toward said comb back.

3,937,232
LIQUID FEEDING MEANS FOR STEAM-PRODUCING APPLIANCE

Patrick M. Tomaro, Maplewood, N.J., assignor to Continental Hair Products, Inc., Edison, N.J.

Filed Jan. 29, 1975, Ser. No. 545,059
Int. Cl.² A45D *2/24*
U.S. Cl. 132—37 R **6 Claims**



1. A liquid feeding means for a steam-producing appliance, comprising:

a. a reservoir for containing liquid,

b. a wick of absorbent material communicating with the interior of said reservoir, a portion of said wick being exposed exteriorly of said reservoir for engagement by a heated element to produce steam, and

c. means extending to the exposed portion of said wick for transmitting air through said wick into said reservoir as liquid is evaporated from the exposed portion of said wick to replace liquid drawn out of said reservoir through said wick.

3,937,233
HAIR CURLER ASSEMBLY

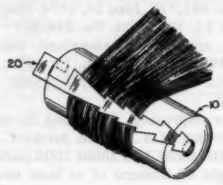
John W. Hook, 3880 State, Abilene, Tex. 79603

Filed Mar. 10, 1975, Ser. No. 557,076
Int. Cl.² A45D *2/00*
U.S. Cl. 132—40 **10 Claims**

1. A hair curler assembly comprising

a generally cylindrical, hollow roller body having one end wall and one open end; said end wall having a small central opening; said body open end being defined by a generally smooth lip disposed in a transverse plane;

an elongated non-elastic fastener having head means at one end, comprising longitudinally spaced enlargements, dimensioned to be forced through said wall opening and to be retained by said end wall, and having hook means

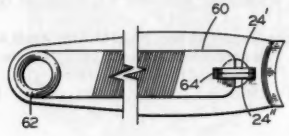


at its other end for engagement with said body lip at its open end.

3,937,234
NAIL CLIPPER

Paul P. Loda, Ansonia, Conn., assignor to The H. C. Cook Company, Ansonia, Conn.

Filed June 20, 1974, Ser. No. 481,032
Int. Cl.² A45D *29/02*
U.S. Cl. 132—75.6 **7 Claims**



1. A nail clipper implement comprising a pair of superposed elongated jaw elements having cooperating cutter jaws at one end thereof and aligned cooperating apertures adjacent said one end; means fastening the other end of said jaw elements, said cutter jaws being spaced apart in one position thereof and said jaw elements being fabricated from resiliently deflectable material to provide yieldable spacing between said cutter jaws; a pivot member seated in said cooperating apertures of said jaw elements and dimensioned and configured for rotation therein; and an elongated operating lever for said jaw elements pivotably mounted at one end on said pivot member adjacent one end thereof and overlying one of said jaw elements, said pivot member being comprised of at least two similarly configured and dimensioned elements of sheet metal stock positioned in side-by-side relationship, the composite pivot member formed by said elements being of generally rectangular cross section and of uniform thickness throughout, said pivot member having an elongated head portion at the other end thereof of greater length than the width of said apertures and disposed outwardly of the other jaw element, said pivot member having a notch extending inwardly adjacent said one end thereof disposed at least in part outwardly of said one jaw element, said operating lever having an aperture adjacent its pivoted end through which said one end of said pivot member extends in the closed position of said operating lever and a pivot portion at its pivoted end engaged in said notch, said operating lever being pivotable in said notch over said pivot member and said pivot member and operating lever being rotatable 180° in said pair of apertures to the operative position of said lever; said implement including means for releasably locking said lever and pivot member against inadvertent rotation relative to said jaw element in at least the closed position thereof, said releasable locking means including a recess in the outer surface of said other jaw element dimensioned and configured to seat the head portion of said pivot member therein, said head portion being disengageable

from said recess by compression of the spacing between said jaw elements.

5. A nail clipper implement comprising a pair of superposed elongated jaw elements having cooperating cutter jaws at one end thereof and aligned cooperating apertures adjacent said one end; means fastening the other end of said jaw elements, said cutter jaws being spaced apart in one position thereof and said jaw elements being fabricated from resiliently deflectable material to provide yieldable spacing between said cutter jaws; a pivot member seated in said cooperating apertures of said jaw elements and dimensioned and configured for rotation therein; and an elongated operating lever for said jaw elements pivotably mounted at one end on said pivot member adjacent one end thereof and overlying one of said jaw elements, said pivot member being of generally rectangular cross section and of uniform thickness throughout, said pivot member having an elongated head portion at the other end thereof of greater length than the width of said apertures and disposed outwardly of the other jaw element, said pivot member having a notch extending inwardly adjacent said one end thereof disposed at least in part outwardly of said one jaw element, said operating lever having an aperture adjacent its pivoted end through which said one end of said pivot member extends in the closed position of said operating lever and a pivot portion at its pivoted end engaged in said notch, said operating lever being pivotable in said notch over said pivot member and said pivot member and operating lever being rotatable 180° in said pair of apertures to the operative position of said lever; said pivot member being fabricated from sheet metal stock and having substantially parallel side surfaces; and an elongated blade member on the outer surface of the other of said jaw elements and pivotably mounted at one end on said jaw elements adjacent the other end thereof, said blade member having a notch at its other end seating the head portion of said pivot member to prevent rotation thereof.

3,937,235

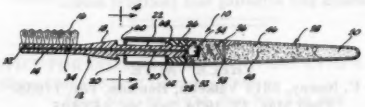
TOOTHBRUSH WITH PASTE CARTRIDGE

John B. Broughton, 7082 Goodview, Riverside, Calif. 92506

Filed Dec. 5, 1974, Ser. No. 529,849

Int. Cl.² A45D *44/18*

U.S. Cl. 132—84 B 8 Claims



1. A toothbrush with paste cartridge comprising:

a reservoir for containing toothpaste and a vaporizing-material-pressurized closed resilient bag in said reservoir for pressurizing toothpaste in said reservoir, an outlet from said reservoir, a brush mounted on and connected to the outlet of said reservoir so that said brush is axially movably mounted with respect to said reservoir, a valve at the outlet of said reservoir for controlling flow of paste from said reservoir to said brush said brush occupying a first axial position in a first direction when said valve is closed and said brush having a shank which engages said valve and opens said valve when said brush is in a second axial position with respect to said reservoir for permitting pressurized paste to flow from said reservoir to said brush.

3,937,236

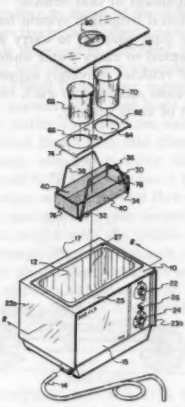
ULTRASONIC CLEANING DEVICE

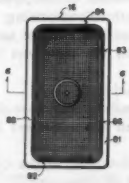
Robert R. Runnells, Kaysville, Utah, assignor to MDT Chemical Company, Gardena, Calif.

Filed Oct. 7, 1974, Ser. No. 512,734

Int. Cl.² B08B *3/12*

U.S. Cl. 134—184 14 Claims





1. An ultrasonic cleaning device comprising:

a housing and an inner container both having side walls and a bottom wall, said inner container being suspended within the housing and separated from the housing by an acoustical energy-absorbing material positioned therebetween;

a means for transferring ultrasonic vibrations through the container; and

a cover for said container, said cover containing a plurality of concave indentations on its inner surface for absorbing and/or reflecting ultrasonic radiation.

3,937,237

UNIVALVE IRRIGATION SYSTEM

Ralph D. Boone, and Charles Griffin, both of Clovis, N. Mex., assignors to Lockwood Corporation, Gering, Nebr.

Filed Feb. 3, 1975, Ser. No. 546,211

Int. Cl.² A01G *25/02*

U.S. Cl. 137—1 9 Claims

1. In an agricultural irrigation system having

a. an elongated pipe adapted to carry a plurality of sprinklers and adapted to carry water under pressure,

b. a plurality of vehicles movingly supporting said pipe,

c. alignment means attached to each vehicle for detecting misalignment of each vehicle,

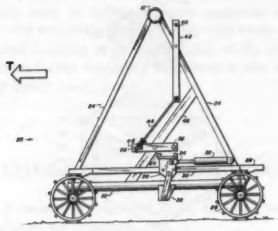
d. a fluid power cylinder on each vehicle,

e. drive means on each vehicle for driving the vehicle responsive to movement of the power cylinder,

f. the improvement in combination with the above comprising:

g. a power tube connected to all the cylinders,
h. a retract means connected to all the cylinders for retracting same after they have been extended,
j. reversing means connected to the power tube for alternately supplying pressurized fluid to the power tube, and
k. blocking means on each vehicle for blocking the movement of the cylinder on that vehicle responsive to detected misalignment of that vehicle.

8. In an agricultural irrigation system having
a. an elongated pipe adapted to carry a plurality of sprinklers and adapted to carry water under pressure,
b. a plurality of vehicles movingly supporting said pipe,
c. alignment means attached to each vehicle for detecting misalignment of each vehicle,



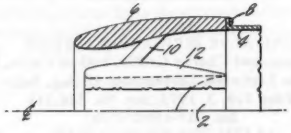
d. a fluid power cylinder on each vehicle, each cylinder having two sides,
e. drive means on each vehicle for driving the vehicle responsive to movement of the power cylinder,
f. the improved method comprising:
g. supplying fluid under pressure to one side of all of the cylinders until all the cylinders have moved as far as permitted, then
h. reversing the fluid and
j. supplying fluid under pressure to the other side of all the cylinders until all the cylinders have moved as far as permitted, and
k. blocking the movement of the cylinder on any vehicle which is forward of alignment.

3,937,238

VARIABLE AREA ENGINE INLET

Donald J. Stewart, Enfield, and Richard A. Streib, Rockville, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 25, 1975, Ser. No. 552,911
Int. Cl.² F02C 7/04
U.S. Cl. 137—15.1 **9 Claims**



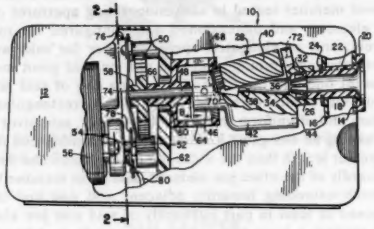
1. An inlet for a gas turbine power plant including
an outer ring forming the outer wall of the inlet,
an inner nose cone defining the inner wall of the inlet,
an annular ring positioned between the outer ring and the nose cone and having a trailing edge positioned substantially in engagement with the nose cone, and
means for moving said annular ring axially to position it such that the trailing edge is movable out from the nose cone.

3,937,239

TIME DELAY MECHANISM FOR PENCIL SHARPENER

James M. Bosland, Wayne, N.J., assignor to Ketcham & McDougall, Inc., Roseland, N.J.

Filed Mar. 19, 1975, Ser. No. 559,908
Int. Cl.² B43L 23/02
U.S. Cl. 144—28.5 **10 Claims**



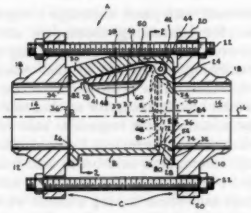
1. Apparatus for automatically sharpening a pencil comprising:
a sharpener housing having an outer end corresponding to the entry point of the pencil to be sharpened and an inner end,
an electric motor being positioned within said housing adjacent said housing inner end,
means for cutting the pencil, said cutting means being positioned within said sharpener housing between said electric motor and said sharpener housing inner end,
a first electrical contact bein electrically connected to said motor and being positioned between said motor and said cutting means,
a second electrical contact being adjacent to and spaced from said first electrical contact and being positioned between said motor and said cutting means, said cutting means being axially movable into engagement with said second electrical contact,
means positioned adjacent the outer end of said housing for frictionally engaging the pencil to be sharpened, said frictionally engaging means being axially movable within said housing into engagement with said cutting means
whereby insertion of the pencil into said frictionally engaging means causes axial movement of said engaging means, said cutting means and said second electrical contact thereby closing said normally separated electrical contacts and actuating said electrical motor.

3,937,240

CHECK VALVE

Walter C. Nanny, 5811 Valkeith, Houston, Tex. 77035

Filed Mar. 22, 1974, Ser. No. 453,595
Int. Cl.² F16K 15/03
U.S. Cl. 137—527.8 **6 Claims**



1. A check valve adapted for mounting between the faces of a pair of pipe flanges having flow passages of substantially

equal diameters, equal radii of curvature, and joined by bolts circumferentially spaced about the flanges, comprising:

a valve body having a flow passage of substantially uniform diameter therethrough;

a clapper mounted with said valve body for closing off said flow passage through said body;

pivotal mounting means for mounting said clapper for movement between a closed position completely blocking said flow passage through said valve body and an open position substantially within a chamber and withdrawn from said flow passage through said valve body;

said valve body including:

upstream and downstream end sections, each of which has a cylindrical flow passage therethrough equal in diameter to the diameter of said pipe flange flow passages and alignable with said pipe flange flow passages;

a chamber section between said end sections having a chamber therein, said chamber communicating with and being adjacent to said flow passage through said valve body and being formed to receive said valve clapper with said valve clapper in its open position;

seating means immediately downstream of said upstream end section and substantially perpendicular to said valve body flow passage for seating said clapper with said clapper in its closed position, said seating means including an annular section having a flow passage therethrough equal in diameter to said end section flow passages and parallel to said end section flow passages, but eccentric with respect to said end section flow passages; and

a downstream section immediately adjoining the downstream side of said seating means and extending to said downstream end section, said downstream section having a partial cylindrical flow passage therethrough with a radius of curvature substantially equal to the radius of curvature of said pipe flange flow passages; and

skirt means mounted on one side of said clapper for forming a complementary partial cylindrical flow passage downstream of said seating means with said clapper in its open position so that said downstream section partial cylindrical flow passage and said complementary partial cylindrical flow passage jointly form a cylindrical flow passage downstream of said seating means which cylindrical flow passage is equal in diameter to said end section flow passages, whereby with said clapper in its open position said valve body has a flow passage of substantially uniform diameter therethrough so that changes in the pressure of fluid flowing through said valve body are minimized.

3,937,241

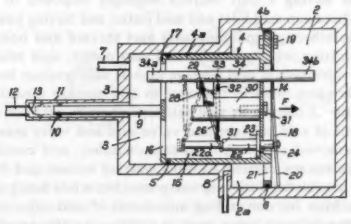
DEVICE FOR INJECTING AN ADJUVANT INTO A LIQUID

Philippe Cloup, 33360 Latresne, France

Filed Nov. 29, 1973, Ser. No. 420,318

Int. Cl.² G05D *11/03*

U.S. Cl. 137—99 **6 Claims**



1. A device for injecting an adjuvant into a liquid, comprising a body having first and second cylinder portions of different cross-sections with end walls at the ends of the body, one end wall forming a closed end of the first cylinder portion and the opposite end wall forming a closed end of the second cylinder portion, a tubular member connected to said opposite end wall of the body having a bore which forms a chamber communicating with the space within said second cylinder portion, stepped piston means slidingly mounted in said body and having first and second piston portions of different cross-sections corresponding to those of the first and second cylinder portions respectively, a plunger connected to the piston means and slidably disposed in said bore, the cross-section of the plunger being less than the cross-section of the bore to provide for flow of fluid thereabout, means for introducing a first liquid under pressure into said body to one side of said piston means, an outlet conduit from said body, means for introducing a second liquid into said chamber comprising a conduit, a pressure responsive valve closing the conduit against flow of liquid from the chamber, a pressure responsive seal about the plunger which prevents flow of fluid around the plunger into the space within the second cylinder portion when the plunger moves with the piston means toward the space within the first cylinder portion and permits flow of fluid around the plunger as the plunger moves toward said pressure responsive valve, and means responsive to the position of said piston for controlling escape of a metered quantity of liquid and adjuvant through said outlet conduit.

3,937,242

PRESSURE CONTROL DEVICE FOR CONTROLLING THE FLOW OF A FLUID MEDIUM

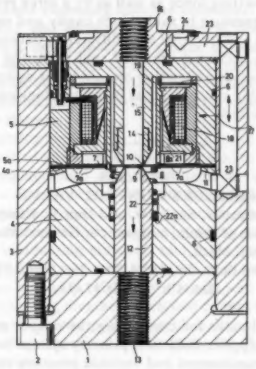
Konrad Eckert, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Sept. 12, 1973, Ser. No. 396,527

Claims priority, application Germany, Sept. 22, 1972, 2246476

Int. Cl.² F16K *31/04*

U.S. Cl. 137—102 **12 Claims**



1. A pressure control device adapted for controlling the flow of a fluid medium and comprising:

a housing;

fluid inlet conduit means in said housing;

fluid return conduit means in said housing, each of which conduit means comprises a valve seat;

connecting means for link-up with a fluid consuming device;

a movable valve member having two operating sides

means mounting said movable valve member to said housing between the valve seats of said inlet and return conduit means so that one operating side of the movable valve member is associated with said inlet conduit means and the other operating side of the movable valve member is associated with said return conduit means;

an inlet cavity operatively associated with said inlet conduit means and defined on said one operative side of said movable valve member;

a return cavity, operatively associated with said return conduit means and said connecting means and defined on said other operative side of said movable valve member,

said movable valve member being displaceable for controlling the cross sectional areas of flow through said inlet and said return conduit means, respectively, in an opposite sense; and

biassing means for applying a resetting force to said movable valve member to reduce fluid influx,

a solenoid including a magnetic core and an armature between which an excitor winding is disposed, said magnetic core and armature having opposite faces of frustoconical shape which extend substantially parallel to each other, said solenoid being disposed within the inlet cavity and about the inlet conduit sleeve

means connected to the armature and the movable valve member for transmitting a force to the movable valve member generated by the solenoid, said force serving to adjust the resetting force to the hydraulic pressures prevailing in the device, said last mentioned means comprising an annular sleeve located coaxially within the magnetic core, said sleeve being resiliently supported by an annular membrane connected to the housing

wherein said fluid inlet conduit means comprises a sleeve which projects into the inlet cavity and which bears one of the valve seats at its free end,

wherein said fluid return conduit means comprises a sleeve which projects into the return cavity and which bears the other of the valve seats at its free end

wherein the valve seat cross sectional area of said return conduit sleeve is smaller than that of said inlet conduit sleeve, whereby a force resulting from the inlet fluid pressure in said inlet cavity and the cross sectional flow area of said inlet conduit sleeve and acting on said one operative side of said movable valve member is opposed by said resetting force as well as by a force resulting from the fluid pressure in said return cavity and said connecting means and from the area difference between the valve seat cross sectional areas of said inlet and said return conduit sleeves and acting on said other operative side of said movable valve member thereby achieving a hydraulic resetting effect.

3,937,243

PRESSURE CONTROL VALVE

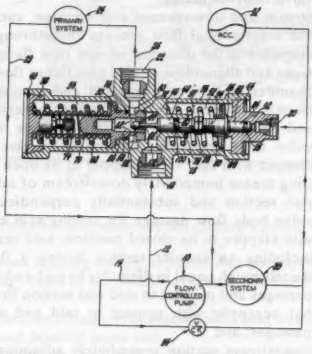
Ronald L. Harkrader, Saginaw, and Dan R. Kimberlin, Frankenmuth, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 25, 1974, Ser. No. 509,247

Int. Cl.[2] G05D *11/03*

U.S. Cl. 137—115 2 Claims

1. A control valve for controlling the output pressure of a pump which supplies fluid to a primary system having a continuous flow requirement and variable pressure requirements, and to a secondary system including an accumulator having a pressure requirement range, the control valve comprising; axially movable first pressure responsive valve means in fluid communication with said pump for controlling the output pressure at a level within the accumulator pressure requirement range and having an axially movable valve element with a valve seat thereon and a central axial opening in said valve seat for directing the flow requirement to the primary system downstream of said first pressure responsive valve means at the pressure level required by the primary system; and second pressure responsive valve means coaxially aligned with said first pressure responsive valve means and being in fluid communication with and responsive to the accumulator pressure to move axially relative to the first pressure responsive valve means and having an axially extending portion in nesting relation with said central axial opening in said valve seat for bypassing the primary system flow requirement through said central axial opening in said first pressure responsive valve means to said primary system thereby establishing the output pressure of the pump equal to the primary system pressure requirement when the accumulator pressure is equal to the



maximum level of the accumulator pressure requirement range, and for preventing bypassing through said first pressure responsive valve means when the accumulator pressure is equal to the minimum level of the accumulator pressure requirement range thereby returning control of the output pressure to said first pressure responsive valve means.

3,937,244

CONDITION RESPONSIVE VALVE CONSTRUCTION

Harley V. Bible, Maryville, and William T. Moon, Jr., Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

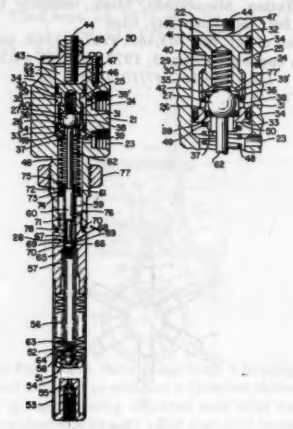
Filed Oct. 21, 1974, Ser. No. 516,429

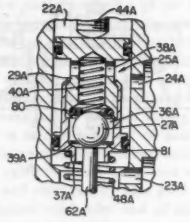
Int. Cl.[2] F16K *31/00*

U.S. Cl. 137—269 9 Claims

1. A condition responsive valve construction comprising a housing means having a chamber therein and an inlet and an outlet leading to and from said chamber, a self-contained valve seat and movable valve member unit removably disposed in said chamber to control the interconnection between said inlet and said outlet, said self-contained unit comprising a retainer having a part thereof sealingly disposed in said chamber between said inlet and said outlet and having passage means therethrough spanning said part thereof and being in communication with said inlet and said outlet, said retainer having a valve seat in said passage means, said retainer having a movable valve member disposed in said passage means and being retained therein by said retainer whereby said self-contained unit of said retainer and valve seat and valve member can be removed as a unit from said chamber, and condition responsive means carried by said housing means and being operably associated with said valve member while being separate therefrom for controlling movement of said valve member relative to said valve seat in relation to the condition sensed by said condition responsive means, said self-contained unit being either a direct acting unit or a reverse acting unit while still being operated by the same condition responsive

means whereby said condition responsive valve construction can be either direct acting or reverse acting depending upon





the self-contained unit being removably disposed in said chamber thereof.

3,937,245

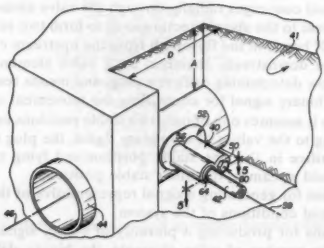
METHOD AND APPARATUS FOR CONNECTING A RIGHT ANGLE SERVICE LINE TO A MAIN

Joe William Christie, Box 386, Frisco, Tex. 75034

Filed May 13, 1974, Ser. No. 469,529

Int. Cl.[2] F14L *41/04*

U.S. Cl. 137—318 **12 Claims**



1. An apparatus for connecting a service line at a right angle to a cylindrical main, comprising a fitting having a concave mounting surface formed on one end thereof, said mounting surface conforming with the exterior surface of said main, first and second parallel spaced through bores extending from said mounting surface through the length of said fitting to the opposite end thereof, said first and second bores having their center lines in a plane with the center line of said concave surface and with the center lines of said bores extending at right angles to the center line of said concave surface; means in said fitting interconnecting said first and second bores, means for connecting a service line in said first bore to extend axially from said first bore, and means in said second bore for receiving a means for forming a port in said main.

3,937,246

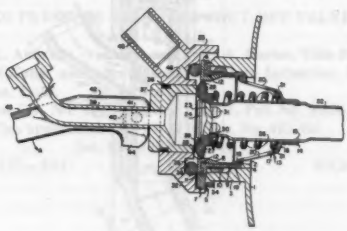
VALVE MECHANISM

Klass Schots, Tilburg, Netherlands, assignor to Hopfma Anstalt, Schaan, Liechtenstein

Filed Mar. 26, 1974, Ser. No. 454,821

Int. Cl.[2] F16K *43/00, 51/00*

U.S. Cl. 137—322 **12 Claims**



1. A valve mechanism, for mounting in an opening of a container, for draining liquid from the container with the aid of a pressurized gas, said valve mechanism operating in conjunction with a connecting piece having a movable gland provided with a bore, an inlet means for inlet of pressurized gas to the container, and an outlet means for outlet of the liquid from the container, said valve mechanism comprising:

a. pipe means extending into the container, being open at the lower end thereof and closed at the top end, for conveying liquid from the container, said pipe means having apertures formed in the upper portion thereof for the flow of liquid from the interior of said pipe means to the outlet means, and further having a connecting groove formed therein;

b. a connecting member for insertion into the opening of the container to permit said pipe means to be mounted into the container, said connecting member being movable between a secured position with respect to the container and a released position with respect to the container;

c. socket means for releasably connecting said pipe means to said connecting member, said socket means having a lower position mounted with said connecting groove of said pipe means to releasably connect said pipe means to said connecting member when said connecting member is in the said secured position, said socket means also having openings therein for permitting the flow of gas into the container;

d. closing means movable in response to the movement of the movable gland in the connecting piece between a closed position blocking entry of the gas into the container and flow of liquid from the container through said apertures in said pipe means, and an open position permitting entry of gas into the container and flow of liquid from the container through said apertures in said pipe means; and

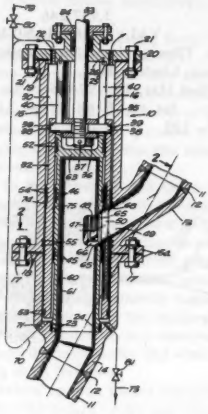
e. said closing means in said open position establishing communication between the interior of said pipe means and the bore in the movable gland for the passage of liquid from the container, and further forming a separate passageway, having walls formed by said closing means, the movable gland, and said connecting member for entry of gas through said openings formed in said socket means into the container.

3,937,247

VALVE FOR FLUIDS CONTAINING ABRASIVE PARTICLES

Jurjen Van der Wal, 1832 Newport Hills Drive, East, Newport Beach, Calif. 92660

Filed Jan. 23, 1974, Ser. No. 435,688
Int. Cl.² F16K 39/02
U.S. Cl. 137—375 19 Claims



1. A seatless cut-off valve for controlling flow of fluent material at temperatures of the order of 1,000°F to 17,000°F. and pressures of the order of 1,000 psi, said cut-off valve having a main body formed by long inner and outer concentric tubes forming an annular chamber therebetween movably housing an open-ended sleeve valve, said sleeve valve having a flow port through its sidewall, said sleeve valve and flow port being movable into and out of registry with aligned flow ports in said first and second tubes, inlet passage means in communication with said aligned flow ports and outlet passage means opening into one end of said inner tube, closure means for said inner tube on the end thereof remote from said outlet passage means, closure means for the opposite ends of said annular chamber between said inner and outer tubes, means connected to said sleeve valve for shifting said sleeve valve between the open and closed positions of said flow ports, fluid seal means to either axial side of said flow ports and between said sleeve valve and the juxtaposed surfaces of said inner and outer tubes which seal means are so positioned and arranged as never to move in contact with a surface of said cut-off valve which is ever in the path of fluent material flowing between said inlet and outlet passage means.

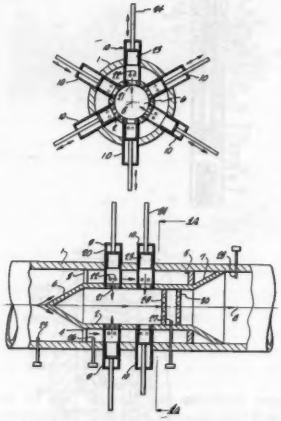
10. A pressure-balanced seatless cut-off valve comprising a main body having inner and outer concentric tubes, closure means crosswise of one set of adjacent ends of said tubes and crosswise of said inner tube in an area remote from said one set of ends, outlet passage means from the other end of said inner tube and including means closing the adjacent end of said annular chamber, a sleeve valve open at both ends movably supported in said annular chamber, the midlength portions of said tubes and of said sleeve valve having flow ports which are in or out of alignment depending on the adjusted position of said sleeve valve in said annular chamber, said main body having inlet passage means opposite the flow ports in said inner and outer tubes, fluid seal means permanently disposed to either axial side of said flow ports providing fluid seals between the juxtaposed surfaces of said sleeve valve and said inner and outer tubes, fluid passage means interconnecting the opposite ends of said annular chamber and cooperating with said fluid seals to neutralize the pressure differential between the opposite ends of said annular chamber and along the interior and exterior surfaces of said sleeve valve.

3,937,248

FLUID FLOW CONTROL SYSTEM EMPLOYING A PLURALITY OF DIGITAL VALVE ELEMENTS

Roger S. Hutton, Minneapolis, Minn., assignor to Process Systems, Inc., Salt Lake City, Utah

Continuation of Ser. No. 703,468, Feb. 6, 1968, abandoned. This application Aug. 3, 1970, Ser. No. 64,142
Int. Cl.² F16G 47/10; G05D 7/03
U.S. Cl. 137—487.5 15 Claims



1. An automatic fluid flow control system comprising:

a cylindrical upstream conduit adapted for fluid flow in a given direction;

a cylindrical downstream conduit adapted for fluid flow in the given direction, the downstream conduit being coaxial with and smaller in cross-sectional area than the upstream conduit;

a plurality of individually actuatable digital valve elements interconnecting the upstream conduit and the downstream conduit, the valve elements being disposed between the upstream and downstream conduits in a plane substantially transverse to the given direction such that fluid converges radially through the valve elements transverse to the given direction so as to form two substantially 90° bends in the flow path from the upstream chamber to the downstream chamber, each valve element having a flow determining orifice, a plug, and means responsive to a binary signal for controlling the movement of the plug so it assumes one of only two stable positions corresponding to the values of the binary signal, the plug closing the orifice in the one stable position and lying outside the fluid stream in the other stable position;

means for generating a signal representative of the dynamic fluid conditions of the system;

means for producing a plurality of binary signals equal to the number of valve elements, the binary signals representing the valve states required to make the dynamic fluid conditions satisfy a predetermined criterion;

means for coupling to the binary signal producing means the signal representative of the dynamic fluid conditions; and

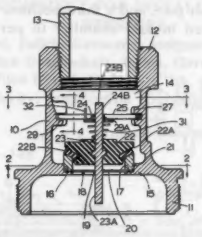
means for coupling the binary signals to the respective valve elements to place their plugs in the positions corresponding to the values of the binary signals.

3,937,249

CHECK VALVE

David P. Suey, St. Louis County, Mo., assignor to Valley Steel Products Company, St. Louis, Mo.

Filed Sept. 18, 1974, Ser. No. 506,955
Int. Cl.² F16K *15/06*
U.S. Cl. 137—543.13 7 Claims



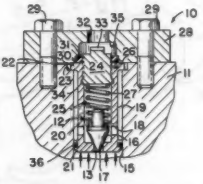
1. A fluid flow check valve comprising: a housing having an inlet end and a discharge end and a chamber therebetween; a valve seat in said housing adjacent said inlet end; a valve member engageable with said valve seat; and means to direct the movement of said valve member into and out of engagement with said valve seat consisting of an elongated guide means on said valve member, a first support for said guide means carried by said housing in a portion between said valve member and said discharge end of said housing, said first support including a collar formed with a body having a flared end and an oppositely directed neck opening slidably engaged about said guide means, and a conical spring element having a large end seated in said flared end of said collar and the small end engaged on said valve member, said spring element acting to close said valve member upon said valve seat, and a second support for and engaged by said guide means carried by said housing adjacent said inlet end of said housing, said first and second supports permitting said valve member and guide means to move laterally for seating of said valve member on said valve seat.

3,937,250

PRESSURE RELIEF ADJUSTMENT MEANS FOR CHECK VALVE

Kenneth F. Golan, Pekin, and Larry W. Oetzel, Washington, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 19, 1974, Ser. No. 498,722
Int. Cl.² F16K *15/02*
U.S. Cl. 137—543.17 25 Claims



1. A valve defining an inlet and an outlet therein comprising a housing,

a valve element mounted for axial movement in said housing,

spring means mounted in said housing to urge said valve element into closing relationship with respect to said inlet,

externally threaded adjustment means threadably mounted for axial movement in said housing to selectively vary the load on said spring means to thus vary the pressure of said valve element,

a clamping member releasably clamped on said housing and having an access opening formed therethrough to overlie and expose said adjustment means, and

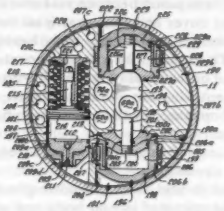
an annular deformable elastomeric locking means compressed axially and radially inwardly under a pre-set clamping force by said clamping member and circumferentially into the external threads of said adjustment means for locking said adjustment means in a predetermined axial position whereby axial adjustment of said adjustment means may be effected by projecting a work tool through said access opening to engage and rotate said adjustment means.

3,937,251

FLUID PRESSURE OPERATED SHUT OFF VALVE APPARATUS

Arthur G. Ahlstone, Ventura, and Josef A. Bartos, Villa Park, both of Calif., assignors to Vetco Offshore Industries, Inc., Ventura, Calif.

Division of Ser. No. 194,187, Nov. 1, 1971, Pat. No. 3,850,237.
This application July 29, 1974, Ser. No. 492,402
Int. Cl.² F16K *31/143*
U.S. Cl. 137—594 9 Claims



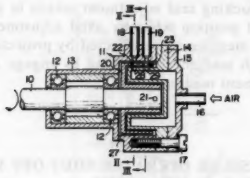
4. In fluid pressure operated control valve apparatus, valve body means providing a flow passage, shutoff valve means for said passage including a valve member shiftable between a first position at which said passage is open and a second position at which said passage is closed, control fluid pressure operated means for holding said valve member in said first position, and means for moving said valve member to said second position, said shutoff valve means comprising a valve chamber intersected by said passage, a valve gate slidable in said chamber between said first and second positions, said control fluid pressure operated means comprising an actuator piston connected with said valve gate, a piston chamber in which said actuator piston is reciprocable, said means for moving said valve gate to said second position including a power piston, a piston chamber in which said power piston is reciprocable, energy storing means normally urging said power piston in one direction, passage means leading between the respective piston chambers at one side of each of said pistons, hydraulic fluid filling said piston chambers and said passage means between said pistons, whereby when said actuator piston is moved by control fluid pressure to move said valve gate from said second position to said first position, said power piston is moved in the other direction to store energy in said energy storing means for moving said power piston in said one direction and said valve gate to said first position when control fluid pressure is reduced, and fluid pressure actuated supplemental means for actuating said valve gate to said second position.

3,937,252

IMPULSE SIGNAL PRODUCING DEVICE OF THE PNEUMATIC PRESSURE TYPE

Takashi Ishida, Ohi, Japan, assignor to Mikuni Kogyo Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1974, Ser. No. 528,624
Int. Cl.² F15C 3/16
U.S. Cl. 137—624.13 3 Claims



1. An impulse signal producing device of the pneumatic pressure type comprising:
a receiving cover,
a pressure cover having an air supply port at its central part and mounted opposite to said receiving cover,
a shaft rotatably supported in said receiving cover and having an end,
a rotatable sleeve mounted on said shaft and shaped so as to define an open end,
a supply body interposed between said receiving cover and said pressure cover and having at least two openings on its circumference, said supply body having a section in the shape of a hat and with a concave central part thereof and mounted on said end of said shaft with a small diameter portion covering the end of said shaft, and said body having said openings in the circumferential surface of a large diameter portion.
a small hole provided in said sleeve in correspondence with one of said openings,
a slot provided in said sleeve in correspondence with the other of said openings in said body and extended in the circumferential direction of said sleeve from on the same generating line of said sleeve as passes through said small hole, and output ports formed in said receiving cover in alignment with rotating paths of said small hole and said slot.

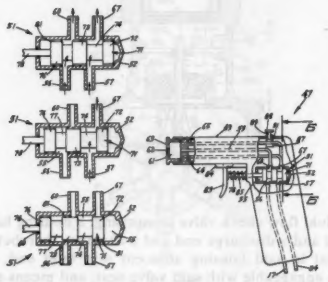
3,937,253

MULTIPLE FLUID DISPENSING APPARATUS

Duane F. Lilja, 2410 Central Ave. NE., Minneapolis, Minn. 55418

Continuation-in-part of Ser. No. 413,768, Nov. 8, 1973, Pat. No. 3,841,555, which is a continuation-in-part of Ser. No. 280,476, Aug. 14, 1972, Pat. No. 3,780,943. This application Oct. 11, 1974, Ser. No. 514,001
Int. Cl.² A16R 11/07
U.S. Cl. 137—625.18 12 Claims

1. A multiple fluid dispensing apparatus comprising:
a casing having interior walls defining a longitudinal chamber having a closed interior end;
a plurality of longitudinally spaced fluid inlets to said chamber adapted to receive a plurality of separate fluids from separate fluid sources;
a plurality of longitudinally spaced fluid outlets from said chamber, a fluid outlet corresponding to each fluid inlet forming a plurality of fluid inlet-outlet pairs;
a linear plunger movably located in said chamber;
said plunger having a plurality of longitudinally spaced heads with portions in sealing engagement with said interior walls operable to block fluid flow between the inlet and outlet of each fluid inlet-outlet pair;
said plunger having a plurality of isolated fluid conduits located between said heads to permit fluid flow through said chamber, one fluid conduit corresponding to each fluid inlet-outlet pair;
said plunger being linerly movable in said chamber between a first position with said heads positioned in said chamber to block fluid flow between the inlet and outlet of each fluid inlet-outlet pair, and a second position with one of said fluid conduits located to permit fluid flow through said chamber between the fluid inlet and outlet of one fluid inlet-outlet pair, and a third position with said fluid conduits located in said chamber to permit fluid flow



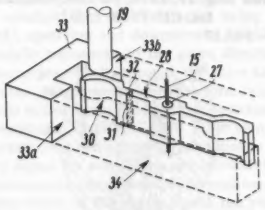
through said chamber between the fluid inlets and outlets of at least two inlet-outlet pairs to provide coordinated discharge of the fluids from the apparatus;
said plunger being longitudinally movable in said chamber from said first position toward the other positions in a direction toward said closed interior end whereby pneumatic pressure developed in said interior end biases said plunger back toward said first position; and
actuator means to actuate movement of the plunger in the chamber.

3,937,254

DEVICE FOR MONITORING CONTROL ELEMENTS

Kurt Stähle, Neuhausen-Steinegg, Germany, assignor to Concordia Fluidtechnik GmbH Steuergerate, Germany

Filed Mar. 4, 1974, Ser. No. 447,832
Claims priority, application Germany, Mar. 9, 1973, 2311698
Int. Cl.² F15B 20/00
U.S. Cl. 137—637 15 Claims



1. A device for monitoring the relative position of synchronously moved control elements, especially for monitoring the movement in a predetermined direction of movement of two valve cases in safety valves controlling a pneumatic or hydraulic drive, comprising a first member of magnetic material fixedly disposed at each of the valve cases, each first member being disposed proximate to a corresponding free end of a pivotally mounted magnetic bar whose basic position is aligned with said valve cases, said magnetic bar having an axis of rotation which is disposed parallel to said direction of movement, and means for magnetically influencing said mag-

netic bar responsive to asynchronous movement of said valve cases such that a signal is triggered for making said drive inoperative when said magnetic bar is swivelled out of said basic position.

3,937,255

SAFETY EQUIPMENT FOR INSTALLATIONS UNDER PRESSURE

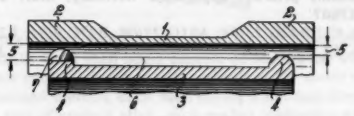
Heiko Barnert, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft, Julich, Germany

Filed Oct. 4, 1973, Ser. No. 403,417

Claims priority, application Germany, Oct. 11, 1972, 2249690

Int. Cl. F16l 9/18, 57/00

U.S. Cl. 138—148 2 Claims



1. Safety equipment for installations containing a medium under pressure, including a wall of the installation the thickness of which is reduced in a predetermined region relative to the remaining region of the wall, and an element disposed within the installation which extends over and beyond said reduced thickness region, said element having bulges formed at its ends which define along with the inner surface of the installation wall a reduced flow cross section through which the pressurized medium flows in the event of damage to the installation wall at the reduced thickness region thereof, said reduced flow cross section being chosen so that the pressure prevailing during normal operation in the space defined by the inner surface of the installation wall and that portion of said element between said bulges is the same as the pressure prevailing in the installation.

3,937,256

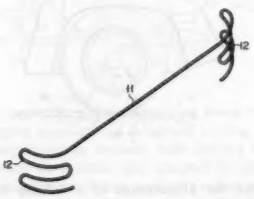
APPARATUS FOR MANUFACTURING CORNER SPRINGS

Yoshiharu Hamaguchi, Fussa, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Filed June 9, 1975, Ser. No. 585,033

Int. Cl.² B21F 35/00

U.S. Cl. 140—71 R 11 Claims



1. A corner spring-manufacturing apparatus which comprises a pair of spring leg-forming mechanisms for folding both ends of a wire several times to provide spring legs at said ends; a pair of heat treatment devices for heat-treating the wire now having spring legs formed at both ends; and a pair of spring leg-bending mechanisms for bending the heat-treated spring legs.

3,937,257

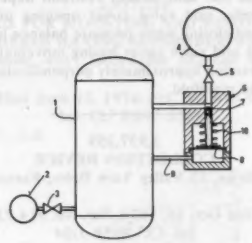
METHOD AND APPARATUS FOR PRESSURIZING RESERVOIRS OF FIRE-FIGHTING EQUIPMENT

Guy Dion Biro, Vincennes, France, assignor to Biro Fils, Paris, France

Filed Dec. 13, 1974, Ser. No. 532,483

Int. Cl.² B65B 1/04, 3/04

U.S. Cl. 141—3 4 Claims



1. A method for pressurizing an operative reservoir with a gas comprising

a. opening communication from an auxiliary source containing a determined quantity of gas under pressure and the reservoir to supply said reservoir with the quantity of gas which when expanded pressurizes the reservoir to a predetermined pressure,

b. actuating via the pressurizing gas in said reservoir regulation device connecting a main source of service gas under high pressure with said reservoir;

c. opening communication between said main source of gas under high pressure and said regulation device for permitting gas under high pressure to flow into said reservoir and supply the same with expanded gas under the action of said predetermined pressure; and

d. automatically balancing the regulation device to effect automatic regulation of the flow of gas under high pressure from said main source to feed said reservoir with expanded gas.

3,937,258

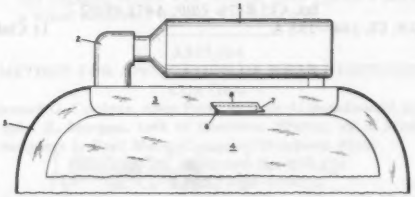
FLEXIBLE FLAPPER

Yogendra S. Loomba, Roseville, Mich., assignor to Allied Chemical Corporation, New York, N.Y.

Continuation of Ser. No. 132,861, April 9, 1971, abandoned. This application Dec. 1, 1972, Ser. No. 311,061

Int. Cl.² B65B 3/04

U.S. Cl. 141—67 5 Claims



1. A safety restraint system for protection of an occupant in a vehicle in which the system is mounted, said system comprising: a gas source, a manifold, an inflatable bag assembly surrounding an outer surface of said manifold, an opening in said manifold communicating with at least a portion of said bag assembly for passing gas from the gas source into the bag assembly, said bag assembly including a smaller inflatable restraint within a larger inflatable primary restraint, said first-

mentioned restraint only in receipt of gas passed through said opening, said manifold being apertured in locations in addition to said opening in order to feed gas therethrough to the primary restraint, and an unapertured, substantially flat, unitary, flexible flapper valve cover attached to said outer surface of said manifold so as to alternately be in a position to completely cover said opening and block passage of gas without protruding thereinto and to uncover said opening to allow passage of gas into said smaller restraint dependent on gas pressure therein, said valve cover opening under pressure differential and closing when pressure balance is substantially achieved, and said valve cover having movement, to open or close, in a direction approximately perpendicular to the outer surface of said manifold.

3,937,259

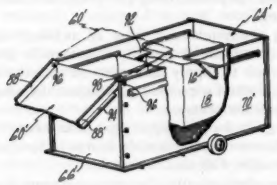
COLLECTION DEVICE

Philip E. Sullivan, 37 Valley View Drive, Farmington, Conn. 06032

Filed Oct. 15, 1974, Ser. No. 514,734

Int. Cl.² B65B 1/04

U.S. Cl. 141—98 **14 Claims**



1. Apparatus for facilitating the collection of debris, such as a pile of leaves, comprising, in combination, a ramp for the transfer of debris thereacross from a receiving end to a discharge end; a support for said ramp to operatively position said receiving end adjacent said debris and relatively elevate said discharge end for the transfer of debris upwardly across said ramp to said discharge end in response to a raking motion; and a container supported by said support and positioned below said discharge end of said ramp during said operative positioning of said ramp for the transfer of debris thereacross for receiving debris discharged therefrom.

3,937,260

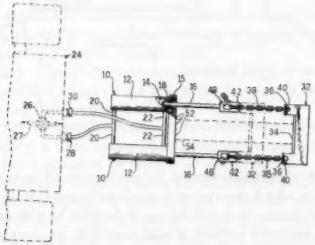
LOG SPLITTER

Max F. Anderson, Stewardson, Ill. 62463

Filed Dec. 13, 1973, Ser. No. 424,441

Int. Cl.² B27L 7/00; A47J 49/02

U.S. Cl. 144—193 A **11 Claims**



1. A portable log splitter for splitting generally horizontally positioned logs lying on the ground comprising,

a pair of spaced fluid operators in generally parallel extending position,

a butt plate extending between said fluid operators and adapted to abut one end of a log to be split,

a splitting blade, and

means for connecting said blade to said operators,

said blade and butt plate being relatively movable together for splitting operation of a log extending therebetween upon actuation of the fluid operators in a direction to draw the blade toward the butt plate.

3,937,261

APPARATUS FOR COMMINUTING TREE STUMPS

Hans Blum, Siegfriedstrasse 14, 6814 Bobstadt, Germany

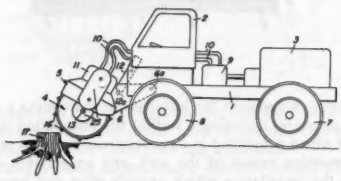
Division of Ser. No. 313,067, Dec. 7, 1972, Pat. No. 3,868,980.

This application Aug. 9, 1974, Ser. No. 496,436

Claims priority, application Germany, Mar. 21, 1972, 2213667

Int. Cl.² B27G 13/04; A01G 23/08; B27C 9/01; B27M 1/00

U.S. Cl. 144—218 **16 Claims**



1. A cutting roller for chipping objects, such as rooted tree stumps upon rotation against the stump, the roller having a cylindrical surface and a parallity of knives projecting therefrom with cutting edges on their extremities, one half section of the roller from one end to the center thereof having knives extending outwardly towards said one end at an angle to a diametrical plane of the roller, the other half section of said roller from said other end of the roller to the center thereof having knives extending outwardly towards said other end at the same, but oppositely directed angle.

3,937,262

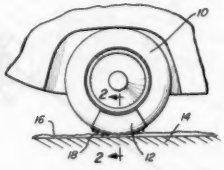
SURE GRIP WINTER TIRE TRACTION DEVICE

Poy Lee, 52 Tennyson St., Somerville, Mass. 02145

Filed Feb. 6, 1975, Ser. No. 547,624

Int. Cl.² B60C 7/22

U.S. Cl. 152—179 **7 Claims**



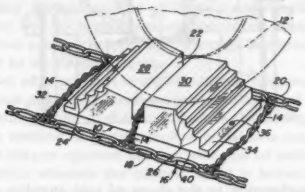
1. A device for attachment to a vehicle tire to improve traction of the tire with a surface upon which the tire rests, said device comprising an arcuate segment of a tire which is slightly larger than the vehicle tire so that the segment can be attached to the vehicle tire, a plurality of studs each having opposite ends, said segment having means for receiving the stud with one end of the stud extending radially outwardly of the vehicle tire and means for holding the stud in fixed position in the segment with the other end of the stud extending radially inwardly of the inner surface of the tire segment for mating with the vehicle tire tread.

3,937,263

TIRE CHAIN CONTAINER AND MOUNTING AID

Milburn L. Hill, 4645 Cambio Court, and Ken M. Sawyer, 35464 Cabral Drive, both of Fremont, Calif. 94536

Filed Feb. 28, 1974, Ser. No. 446,609
Int. Cl.² B60C 27/00
U.S. Cl. 152—213 R 1 Claim



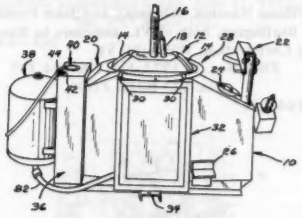
1. A tire chain container and mounting aid comprising a pair of shells, each shell being capable of bearing the weight of a motor vehicle when one of the wheels of the motor vehicle is disposed thereon, each shell having a flat face through which a pair of pockets open, each pocket registering with a pocket in the other shell when said flat faces are brought together in registration, thus forming a pair of separate chambers, each chamber being adapted to contain a tire chain, the pair of pockets in at least one of said shells being separated by a common wall containing a third pocket of such size as to be capable of containing spare tire chain hardware, such as spare links, tire chain clips, or the like, and the common wall between the tire chain receiving pockets of each shell containing a channel open to the side of the shell opposite its said flat face and extending to and through each wall of the shell which is perpendicular to said common wall.

3,937,264

BEAD SEATING AND INFLATION APPARATUS FOR A TIRE CHANGING STAND

John L. Mikovits; Elmer J. Strang; Ray A. Scott, and Billy L. Sorenson, all of Fort Dodge, Iowa, assignors to The Coats Company, Inc., La Vergne, Tenn.

Filed Mar. 3, 1972, Ser. No. 231,647
Int. Cl.² B60C 25/12
U.S. Cl. 157—1.1 4 Claims



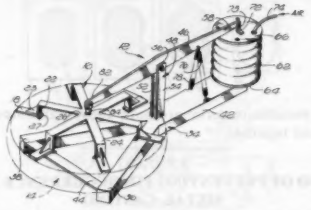
1. A kit for converting a tire changing stand to a combination tire changing stand and a tire bead seating and inflating apparatus comprising: an arcuate tube having a plurality of inwardly directed air nozzles and adapted to be affixed to a tire changing stand in a relation generally concentric to a table top and spindle thereon; a first conduit in fluid communication with said tube and said air nozzles thereon and adapted to be connected to a source of air under pressure; first valve means in said conduit for controlling the flow of air from said source to said air nozzles; an air chuck adapted to be connected to a valve stem on a wheel rim received on said table top, a second conduit having one end connected to said air chuck and another end adapted to be connected to a source of air under pressure; second valve means in said second conduit for controlling the flow of air therethrough; means defining a common actuator for said first and second valves, said common actuator being movable between three positions, one of which causing both said valve means to be closed, another of which causing both said valve means to be open, and the last of which causing said first valve means to be closed and said second valve means to be open; and means for securing said arcuate tube, said valves and said actuator to a tire changing stand.

3,937,265

APPARATUS FOR MOUNTING AND REMOVING TIRES FROM WHEELS HAVING SEPARABLE WHEEL RIMS

Fred C. Wilson, 4611 Dockweiler St., Los Angeles, Calif. 90019

Filed June 12, 1974, Ser. No. 478,472
Int. Cl.² B60C 25/06
U.S. Cl. 157—1.2 1 Claim



1. Apparatus for use in conjunction with the removing and mounting of truck tires on wheels having separable rims comprising:

A. a Y-shaped support member including a base and a pair of legs extending outwardly from one end of said base, said pair of legs being separated sufficiently to receive at least a portion of said wheel therebetween;

B. a lever having first and second ends;

C. a fulcrum affixed to and extending from said base adjacent said one end thereof;

D. means pivotally attaching said lever intermediate the ends thereof to said fulcrum;

E. tire engaging means including a hub and a plurality of L-shaped arms each including a portion extending radially from said hub in a plane parallel to the tire and support member, said arms being symetrically distributed about the circumference of said hub;

F. means pivotally connecting said hub to said first end of said lever;

G. fluid actuated power assist means affixed to said base at the other end thereof; and

H. means pivotally connecting said second end of said lever to said power assist means, thereby to reciprocate said tire engaging means with variable force against a tire on a wheel supported on said Y-shaped legs.

3,937,266

METHOD FOR APPLICATION OF WEAR-RESISTANT COATING

Leonard G. Cordone, Allen Park; William A. Donakowski, and John R. Morgan, both of Dearborn Heights, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Aug. 20, 1973, Ser. No. 390,131
Int. Cl.² B22D 19/00, 27/02
U.S. Cl. 164—9 11 Claims

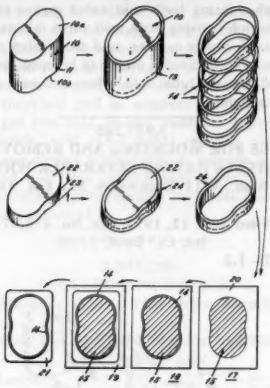
1. A method of producing a coated rotor housing for a rotary internal combustion engine, comprising:

a. defining first and second mandrels each having an outer surface complimentary to the resultant internal surface for the rotor housing,

b. electrolytically depositing a thin coating of a composite particle wear-resistant material on said first mandrel,

c. separating said first mandrel from said coating leaving said coating as an independent unsupported liner, and

d. placing said liner about said second mandrel and casting a molten metallic material thereabout whereby the liner



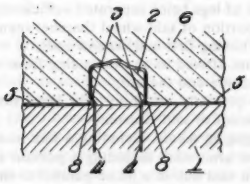
and metallic material are both alloyed and mechanically locked together.

3,937,267

METHOD OF PREVENTING FIN OCCURRENCE DURING METAL CASTING

Ichiya Maeda, Nagano, and Tsuneyoshi Kuroiwa, Suzaka, both of Japan, assignors to Kabushiki Kaisha Akita, Japan

Filed Jan. 3, 1974, Ser. No. 430,553
Int. Cl.² B22C 3/00
U.S. Cl. 164—47 1 Claim



1. A method for preventing a fin from occurring during metal casting comprising: providing a mold having a recess therein with a protuberance extending completely around the periphery of the recess and outwardly beyond the parting line of the mold and a film of soft plastic covering the mold including the protuberance; pressing the mold against another mold to form a cavity and squash the protuberance, the protuberance being held by the plastic film; preparing a melt of a metal; and casting the melt into the cavity.

3,937,268

METHOD FOR BONDING A BRONZE BUSHING ON A METALLIC MEMBER

Richard G. Loebs, Peoria, and Richard C. Ostrowski, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 5, 1974, Ser. No. 494,970
Int. Cl.² B22D 21/02, 23/06, 19/08
U.S. Cl. 164—66 8 Claims

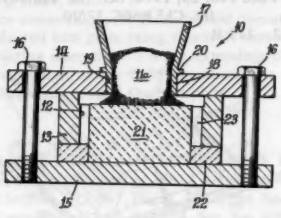
1. A method for bonding an annular bearing on a cylindrical surface of a metallic member comprising the steps of

positioning said metallic member in a fixture to define an annular chamber closed at a first end and open at a second end thereof,

placing a charge of a metallic bearing alloy in particle form adjacent to and in communication with the open end of said annular chamber in a predetermined quantity sufficient to at least substantially fill said chamber,

melting said bearing alloy and at least substantially filling said annular chamber therewith by gravity flow, and

cooling said metallic member and said melted bearing alloy to ambient temperature to form a solidified annular bearing, conforming to the shape of said annular chamber, bonded to said metallic member.



3,937,269

MOLD POWDER COMPOSITION AND METHOD FOR CONTINUOUSLY CASTING EMPLOYING THE SAME

Eugene A. Salvadore, Coraopolis, Pa., and Paul J. Zimmerman, Grosse Ile, Mich., assignors to Crucible Inc, Pittsburgh, Pa.

Filed Apr. 8, 1974, Ser. No. 458,745
Int. Cl.² B22D 11/08
U.S. Cl. 164—73 1 Claim

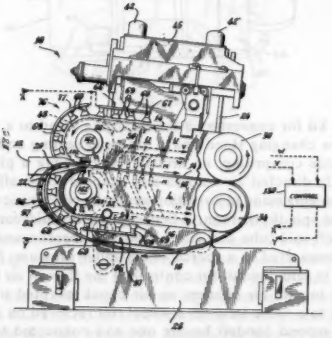
1. In the continuous casting of stainless steel wherein said steel is teemed from a tundish to a flow-through continuous-casting mold via a submerged refractory nozzle from which a continuous, embryo casting is withdrawn, the improvement comprising the introduction to said mold during the teeming operation of a mold powder of the composition consisting essentially of, in percent by weight, 30 to 60 fly ash, 10 to 25 calcium fluoride, up to 15 sodium carbonate, up to 15 calcium carbonate, up to 10 cryolite, up to 10 sodium borate, 2 to 8 graphite, 4 to 12 manganese oxide, up to 15 powdered glass, up to 5 iron oxide.

3,937,270

TWIN-BELT CONTINUOUS CASTING METHOD PROVIDING CONTROL OF THE TEMPERATURE OPERATING CONDITIONS AT THE CASTING BELTS

Robert William Hazelett, Winooski, and John Frederick Barry Wood, Burlington, both of Vt., assignors to Hazelett Strip-Casting Corporation, Winooski, Vt.

Filed Nov. 9, 1973, Ser. No. 414,237
Int. Cl.² B22D 11/06
U.S. Cl. 164—50 17 Claims



8. The method of casting molten metal in a casting region defined between opposed portions of a pair of revolving end-

less flexible metal casting belts wherein the molten metals is introduced into the casting region and is carried downstream through the casting region by the moving belts while the metal is solidifying, comprising the steps of:

elevating the temperature of the main central portion of at least one of said metal casting belts before the main central portion of said belt encounters the molten metal in the casting region, and

elevating the temperature of the two edge portions of said metal belt to higher temperature levels than said main central portion before said two edge portions pass adjacent to the casting region,

said two edge portions being elevated to temperature levels at least as great as the mean temperature level of the main central portion of the metal belt in the casting region.

9. The method of casting molten metal in a casting region defined between opposed portions of a pair of endless flexible casting belts wherein the molten metal is introduced at an entrance to the casting region and thereafter the molten metal travels downstream from the entrance while solidifying between the front faces of the two casting belts and wherein the heat from the solidifying molten metal is withdrawn by applying liquid coolant to the reverse surfaces of the two casting belts, comprising the steps of:

directing intensive radiant heat energy onto the front faces of the respective revolving casting belts for elevating their temperature before the respective casting belts reach the entrance to the casting region, and

controlling the application of the liquid coolant to the reverse surfaces of the respective casting belts for initially applying the coolant to the reverse surfaces of the belts only a small distance from the position where the molten metal initially comes into contact with the front face of the respective casting belt.

3,937,271
MEASURING MEANS FOR MEASURING SECONDARY COOLING ZONE ROLLER GAPS IN CONTINUOUS CASTING MACHINE

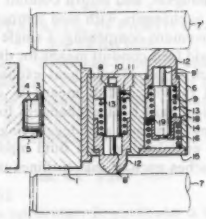
Toyoaki Akiba, Tokyo; Takero Sato, Niihama; Makoto Tokuda, and Hiroshi Tomono, both of Wakayama, all of Japan, assignors to Sumitomo Shipbuilding and Machinery Co. Ltd., Tokyo and Sumitomo Metal Industries Limited, Osaka, both of, Japan

Filed June 10, 1974, Ser. No. 478,159

Claims priority, application Japan, June 11, 1973, 48-66129

Int. Cl.² B22D *1/02*

U.S. Cl. 164—150 **9 Claims**



1. A measuring device for measuring the separation distance between conveying rollers in the secondary cooling zone of continuous casting machines comprising transport means adapted to be guided through said cooling zone between said rollers, said transport means having a maximum dimension parallel to said separation distance which is less than said distance and at least one distance detecting means mounted on said transport means for movement therewith, said distance detecting means including at least one probe projecting beyond the limits of said transport means for engagement with a roller, said probe being displacably supported on said transport means and providing an output signal corresponding in magnitude to the extent of said displacement whereby upon movement of said transport means through said zone, said signal provides an indication of variations in said separation distance along said zone.

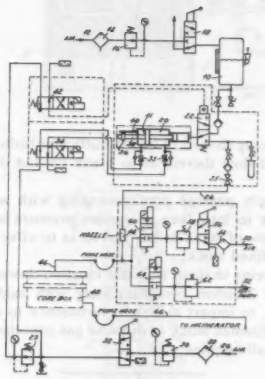
3,937,272
COLD SET CATALYST SUPPLY AND FUME INCINERATOR FOR A FOUNDRY CORE MAKING MACHINE

Lawrence E. Flora, Bloomfield Hills, and Billy G. DuBois, Linden, both of Mich., assignors to Sutter Products Company, Holly, Mich.

Filed Oct. 29, 1973, Ser. No. 410,777

Int. Cl.² B22C *9/12;* **B22D** *27/14;* **F23G** *3/00*

U.S. Cl. 164—159 **18 Claims**



1. Production apparatus for making cold set foundry cores or articles comprising a pattern box adapted to receive fully enclosed cold set resin coated sand cores or articles, high super atmospheric pressure accurately adjustable liquid catalyst injection means adapted to repeatedly supply predetermined quantities of atomized liquid catalyst to said box, said injection means including controls adapted to actuate cyclically in coordination with the curing cycle of said apparatus, purging means adapted to purge fumes in coordination with said curing cycle from said box, and incineration means adapted to continuously draw fumes from said box and oxidize said fumes to inert substances.

3,937,273
FORMING NON-WOVEN FIBROUS MATERIAL

Bronislaw Radvan, Flackwell Heath, and Kieron Philip Green, Thame, both of England, assignors to Wiggins Teape Limited, London, England

Filed Nov. 18, 1974, Ser. No. 524,814

Claims priority, application United Kingdom, Nov. 26, 1973, 54694/73

Int. Cl.² D21F *1/02*

U.S. Cl. 162—212 **17 Claims**

1. A method of making non-woven fibrous material such as paper comprising the steps of:

confining and directing a flow of stock through a slot toward a foraminous support;

breaking up and dispersing fibre flocs by imparting turbulence to the confined flow in the slot;

effecting foaming of the confined stock by introducing gas under pressure into the confined flow of stock in the slot;

dispersing gas contained in the foamed stock as very small bubbles by imparting turbulence to the confined flow of

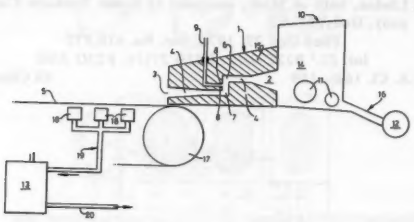
foamed stock at a slot location downstream from the introduction of the gas;

delivering the confined foamed stock having the broken up and dispersed fibre flocs and the dispersed very small bubbles from the slot onto the foraminous support; and

draining the stock on the foraminous support.

6. A slice for the headbox of a papermaking machine, comprising:

a body including a slot to confine and direct a flow of stock from a headbox chamber toward the papermaking wire of the machine;



said slot being shaped to impart sufficient turbulence to the confined flow therein as to break up and disperse fibre flocs;

a gas supply passage communicating with said slot and operable to introduce gas under pressure into the confined flow of stock in the slot so as to effect foaming of the confined stock;

said slot being shaped, at a slot location downstream from the slot location communicating with said gas supply passage, to impart sufficient turbulence to the confined flow of foamed stock to disperse gas contained therein as very small bubbles.

3,937,274

BELT BACK-UP APPARATUS AND COOLANT APPLICATION MEANS FOR TWIN-BELT CASTING MACHINES

John M. A. Dompas, Olen, Belgium, assignor to Hazelett Strip-Casting Corporation, Winooski, Vt.

Filed May 15, 1974, Ser. No. 470,214

Int. Cl.² B22D *11/06*

U.S. Cl. 164—278 **11 Claims**

1. In a twin-belt casting machine for continuously casting molten metal wherein the molten metal is confined in a casting zone defined between the front faces of a pair of revolving flexible casting belts moving along in spaced opposed face-toward-face relationship with a pair of laterally spaced revolving side dams moving between the casting belts and each being spaced inwardly from the respective edges of the belts for defining the side edges of the casting region and wherein the reverse surfaces of the respective casting belts are supported and guided by a plurality of back-up rollers extending transversely across the full width of the casting belts and having multiple narrow fins engaging the reverse surfaces for permitting liquid coolant to travel along these reverse surfaces and in which there are coolant supply means with multiple nozzles for providing liquid coolant to travel along the reverse surfaces of the casting belt, the invention characterized by said back-up rollers each having a pair of cylindrical collars thereon said collars each being spaced inwardly from the respective ends of said rollers and engaging the reverse surfaces of the casting belts directly opposite the respective side dams, said pairs of cylindrical collars being spaced apart on the respective back-up rollers by a distance no greater than the lateral spacing between said side dams and being positioned in alignment with the respective side dams for holding the front faces of the casting belts firmly against the side dams and in which said coolant nozzles are absent from positions adjacent to and aligned with the regions where the said cylindrical collars engage the reverse surfaces of the casting belts.

3,937,275

SYSTEM FOR THERMAL EXCHANGERS

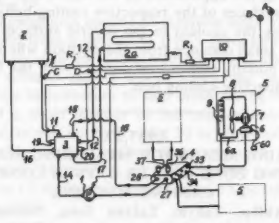
Bernard Boisseau, 20 rue de l'Oisillonnette, 49 Cholet, France

Filed May 21, 1973, Ser. No. 362,271

Claims priority, application France, May 24, 1972, 72.19609

Int. Cl.² F24H *3/02*

U.S. Cl. 165—85 **6 Claims**



1. In a heat exchange system utilizing hot or cold fluid as a medium, said system including means for changing the temperature of said fluid medium, a plurality of thermal exchangers each including an air ventilator driven by a turbine, pump means for propelling said fluid medium through said thermal exchangers and returning it to said temperature changing means, feed conduit means connecting said pump means with said thermal exchangers, and return conduit means connecting said thermal exchangers with said temperature changing means, the improvement comprising: a single degasifying box connected with said feed conduit means for distributing hot or cold fluid medium to all of said heat exchangers, and connected with said return conduit means to collect the fluid medium from all of said heat exchangers for return to said temperature changing means, said degasifying box functioning to remove gases entrained in said fluid medium before said fluid medium reaches each of said turbines through said feed conduit means.

3,937,276

AFTERCOOLER FOR AIR COMPRESSOR

Richard Ostwald, Bowling Green, Ky., assignor to Gordon Smith & Co., Inc., Bowling Green, Ky.

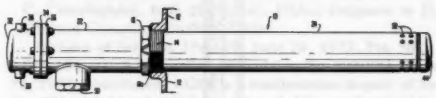
Filed May 21, 1974, Ser. No. 472,024

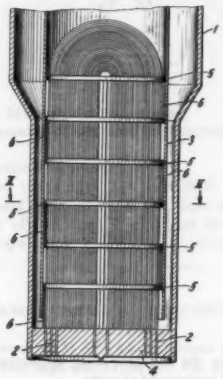
Int. Cl.² F28D *1/06*; F28F *1/00*

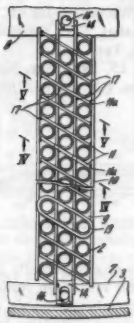
U.S. Cl. 165—135 **10 Claims**

1. An aftercooler for cooling compressed gas such as compressed air, the aftercooler including a tubular casing having a plurality of internal ducts for conveying coolant fluid therethrough with spaces between the ducts, said casing having a first inlet port for introducing coolant fluid into the casing to

pass through certain of said cooling ducts, an outlet port for discharging spent cooling fluid from the casing, said casing having a second inlet port for introducing a compressed gas to be cooled such as compressed air into the casing to pass in the spaces between the cooling ducts, said casing having outlet means adjacent one end thereof for exiting the cooled compressed gas from the casing and into a receiving tank, and said casing having means for fixing a portion of said casing to a wall of a receiving tank with said outlet means for the compressed gas located within a receiving tank, and with said inlet and outlet ports for the cooling fluid located externally of a receiving tank, and wherein said inlet and outlet ports for the coolant fluid are situated adjacent the end of the casing opposite said one end where said outlet means for the compressed gas is located, and wherein the outlet means for exiting the compressed gas includes a first set of a plurality of small apertures angularly spaced around the periphery of the casing for reducing noise associated with the discharge of the compressed gas.







3,937,277

TUBULAR APPARATUS, IN PARTICULAR A STEAM GENERATOR

Siegfried Krolmann, Dinslaken-Hiesfeld, and Bruno Heinen, Oberhausen, both of Germany, assignors to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Filed Mar. 18, 1974, Ser. No. 452,251

Claims priority, application Germany, Mar. 17, 1973, 2313438

Int. Cl.² F28F 9/00

U.S. Cl. 165—162 **10 Claims**

1. In a tubular apparatus, in particular a steam generator, comprising a casing, a shell within said casing, a tube bundle having a plurality of tubes mounted within said shell, and a number of grating means in said shell for maintaining said tubes at a certain distance from each other, the improvement comprising each of said grating means comprising one ring-shaped frame, and a plurality of longitudinally parallel grating elements secured on said frame, each of said grating elements having a plurality of parallel grating bars, a plurality of cross-bars, each of said cross-bars spanning transversely and at an angle across said plurality of parallel grating bars, and contacting each of said plurality of parallel grating bars, each of said cross-bars comprising means for securing said grating bars to each of said cross-bars, and mounting means at both ends of each of said grating elements for mounting said grating element to said frame, said mounting means being carried by at least one of said plurality of grating bars.

3,937,278

SELF-PROPELLING APPARATUS FOR WELL LOGGING TOOLS

Adel El Sheshtawy, 300 W. Grauwyler Road, Irving, Tex. 75061

Filed Sept. 12, 1974, Ser. No. 505,239

Int. Cl.² E21B 47/00

U.S. Cl. 166—63 **20 Claims**

1. A self-propelling apparatus for well logging tools for use within a well bore having a well fluid therein comprising:

a housing defining a cylinder therein and including means for attachment to an end of an elongated well logging tool;

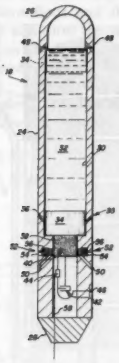
vent means communicating between the cylinder in the housing and the exterior thereof wherein said vent means are outwardly directed;

a piston initially received in one end of the cylinder;

said cylinder for initially receiving a quantity of liquid to establish an overall negative buoyancy in the well fluid for the self-propelling apparatus and the well logging tool connected thereto; and

means responsive to a predetermined signal for driving the piston from its initial position to the opposite end of the

cylinder to expel the liquid from the cylinder through said vent means and thereby establish an overall positive



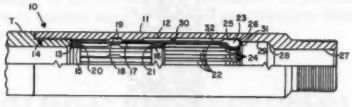
buoyancy for the self-propelling apparatus and the well logging tool connected thereto.

3,937,279

RETRACTABLE LANDING SHOULDER FOR DOWNHOLE DEVICES

George M. Raulins, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Dec. 23, 1974, Ser. No. 535,958
Int. Cl.² E21B *23/00*
U.S. Cl. 166—214 **11 Claims**



11. In a tubular housing threadedly connectable to a pipe string, internal shoulder means on resilient collet arm extensions from a sleeve member movable radially inwardly and outwardly between inward restrictive bore opening and outward full-bore opening positions; and collet arm extension shoulder positioning cam means in said tubular housing for camming said collet arm extensions between the radially outward and inward positions, using primarily straight longitudinal movement of the sleeve member, with the resilient collet arm extensions, through a camming range of movement.

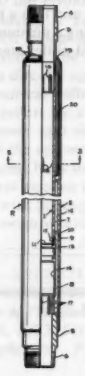
3,937,280

ARTIFICIAL LIFT WELL APPARATUS

Robert W. Dinning, Houston, Tex., assignor to Macco Oil Tool Company, Inc., New York, N.Y.

Filed Feb. 3, 1975, Ser. No. 546,440
Int. Cl.² E21B *43/00, 17/14*
U.S. Cl. 166—224 R **25 Claims**

1. Apparatus for use in a well having an outer pipe string for flow of a first fluid and an inner pipe string for flow of a second fluid, comprising in combination: receiver means adapted for connection in said inner pipe string and having port means providing communication between said inner and outer pipe strings; and a well tool adapted for movement through said inner pipe string into sealing engagement with said receiver means, said well tool having valve means for controlling fluid flow between said inner and outer pipe strings through said port means; said receiver means including first tubular means adapted for reception of said well tool and through which said fluid communication between said inner and outer pipe string is established, and second tubular means concentrically surrounding said first tubular means and laterally spaced therefrom to define an annular passageway therebetween that communicates with said first tubular means above and below



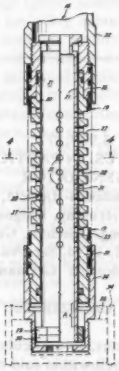
the sealing engagement of said well tool with said receiver means and through which at least a portion of said second fluid flow may by-pass said well tool.

3,937,281

HIGH LOAD SELF-CLEANING HELICAL SPRING FILTERS

Bobby G. Harnsberger, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed June 27, 1974, Ser. No. 483,504
Int. Cl.² E03B *3/18*; B01D *25/34*
U.S. Cl. 166—233 **13 Claims**



1. A self-cleaning helical spring filter in combination with a tubing string comprising,

a. a vertically actuatable tubing string having an upper end and a lower end extending down into a well to a liquid-containing sand strata,

b. helical spring means connected to said lower end of said tubing string having a plurality of coaxial convolutions,

c. helical grooved hollow elongated mandrel means in frictional contact with the internal surface of said spring

means convolutions and connected to a lower end of said helical spring means,

d. the pitch of said mandrel means grooves being opposite to the pitch of said spring means convolutions,

e. said helical spring means having an upper end connected to said tubing string lower end for expanding the helical spring means, and

f. holes formed in said mandrel means grooves for providing, when said spring means is expanded, increased cleaning action, increased flow of production liquids through the helical spring filter, and increase resistance to lateral forces on the spring.

3,937,282
METHOD FOR CEMENTING WELLS IN LOW TEMPERATURE FORMATIONS

Stanley H. Shryock, Brea, Calif.; Charles R. George, and Willis C. Cunningham, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 374,609, June 28, 1973, Pat. No. 3,891,454, which is a continuation of Ser. No. 129,983, March 31, 1971, abandoned, which is a continuation-in-part of Ser. No. 821,946, May 5, 1969, abandoned. This application Mar. 24, 1975, Ser. No. 561,570

Int. Cl.² E21B *33/13*

U.S. Cl. 166—293 **14 Claims**

1. A process for cementing pipe in a well which penetrates a low temperature formation comprising depositing in the space between said pipe and said formation an aqueous slurry of a hydraulic cement composition and thereafter allowing said slurry to harden, wherein said slurry consists essentially of:

a hydraulic cement, gypsum, a monovalent chloride salt, a setting time retarding agent and water;

wherein said hydraulic cement is present in said composition in the range of about 15 to about 35 pounds per 75 pounds of dry solids, the weight ratio of said gypsum to said hydraulic cement in said composition is in the range of about 1:1 to about 3:1, said monovalent chloride salt is present in said composition in the range of about 1 to about 3.5 pounds per 75 pounds of dry solids, said setting time retarding agent is present in said composition in the range of about 0.01 to about 0.525 pounds per 75 pounds of dry solids, and said water is present in said composition in the range of about 3 to about 5 gallons per 75 pounds of dry solids.

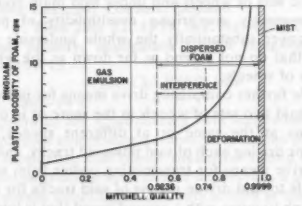
3,937,283
FORMATION FRACTURING WITH STABLE FOAM

Roland E. Blauer, Golden, and Clarence J. Durborow, Englewood, both of Colo., assignors to The Dow Chemical Company, Midland, Mich. and Minerals Management, Inc., Denver, Colo.

Filed Oct. 17, 1974, Ser. No. 515,557

Int. Cl.² E21B *43/26, 43/27*

U.S. Cl. 166—307 **20 Claims**



1. A method of extending an initially fractured subterranean formation penetrated by a well bore with a stable foam, said foam comprising a mixed dispersion of a liquid base, a surfactant, a propping agent and a gas such that the Mitchell quality of said foam at the temperature and fracture extension pressure of the formation, as derived from the formula:

$$\Gamma_{tp} = \frac{V_w}{V_f}$$

where

Γ_{tp} = the Mitchell derived quality

V_w = the volume of saturated gas (excluding gas in solution if any)

V_f = the volume of foam

is between the range of 0.5236 to 0.9999;

injecting said foam into said well bore and increasing the pressure of said foam against said formation to reopen and/or extend said initial fracture of said formation.

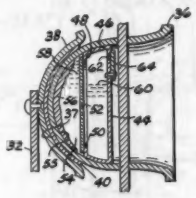
3,937,284
EXOTHERMIC CHEMICAL REACTIVE SPRINKLER RELEASE

Richard J. Young, 2131 SW. 42, Oklahoma City, Okla. 73119

Filed Sept. 30, 1974, Ser. No. 510,687

Int. Cl.² A62C *37/18*

U.S. Cl. 169—37 **6 Claims**



1. An exothermic release for a thermally sensitive sprinkler head having a fusible element normally maintaining the sprinkler head inactive, the improvement comprising:

a thermally sensitive heat generating capsule disposed adjacent said fusible element,

said capsule confining a heat expansible medium with a quantity of sodium and containing water; and,

partition means capable of being ruptured by the expansion of said expansible medium beyond a predetermined limit for commingling said sodium and water and fusing said fusible element, normally separating said sodium and expansible medium from said water.

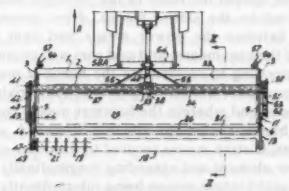
3,937,285
CULTIVATORS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Apr. 16, 1974, Ser. No. 461,376

Int. Cl.² A01B *33/00*

U.S. Cl. 172—52 **17 Claims**



1. A cultivator comprising a frame and a first soil-working rotor of bar-like configuration rotatably mounted on said

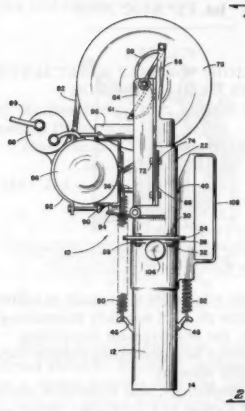
frame with driving means connected to said first rotor, a second soil-working rotor rotatably mounted on said cultivator in driving connection with said driving means, said first rotor having a polygonal periphery, said rotors being located one behind the other and rigid means for fixing the relative positions of said rotors on said frame to work soil at different depths and for positioning said first rotor substantially entirely below the surface of the ground to work sub-soil said first rotor having an effective diameter that is substantially smaller than that of said second rotor.

3,937,286

FENCE POST DRIVER

Carl F. Wagner, Rte. 3 Box 79, Cushing, Okla. 74023

Filed May 13, 1974, Ser. No. 469,375
Int. Cl.² B25D *11/00*
U.S. Cl. 173—119 **2 Claims**



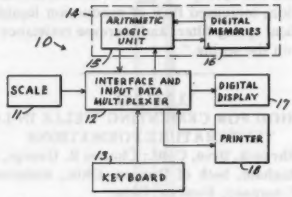
1. A fence post driving tool comprising sleeve means having one end thereof open for receiving one end of a fence post therein, hammer means slidably disposed in said sleeve means and movable through the opposite end thereof, yieldable means secured between the sleeve means and the hammer means for constantly urging the hammer means in one direction with respect to the sleeve means, cam means journalled in the proximity of one end of the hammer means and intermittently engagable therewith for moving the hammer means in a direction against the force of the yieldable means, power means carried by the sleeve means, drive means operably connected between the power means and cam means for actuating of the cam means, and said cam means and yieldable means cooperating to reciprocate the hammer means within the sleeve means for transmitting intermittent driving force to the fence post, and wherein the hammer means comprises an elongated hammer element slidably disposed within said sleeve means, U-strap means secured to the outer extremity of said hammer element and extending longitudinally outwardly therefrom, said U-strap means being intermittently engagable by said cam means for imparting movement to the hammer element in one direction against the force of the yieldable means.

3,937,287

DATA FILTERING CIRCUITRY

Edward G. Pryor, Toledo, Ohio, and Richard C. Loshbough, Temperance, Mich., assignors to Reliance Electric Company, Cleveland, Ohio

Filed Apr. 17, 1974, Ser. No. 461,518
Int. Cl.² G01G *19/04*
U.S. Cl. 177—25 **4 Claims**



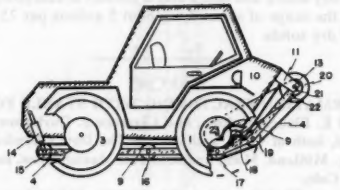
1. A digital weighing scale comprising, in combination, means for generating a digital weight signal corresponding to the weight of an article, memory means for storing a filtered weight, a counter, means for periodically comparing the generated weight signal with the stored filtered weight, means responsive to a comparison between the generated weight signal and the stored filtered weight for clearing said counter, means responsive to the generated weight signal deviating from the stored filtered weight by a weight less than a predetermined amount for incrementing said counter, and means responsive to a predetermined count in said counter for storing the generated weight signal in said filtered weight memory means.

3,937,288

ALL TERRAIN VEHICLE

Paul Kehler, South Bend, Ind., assignor to Applied Inventions Corporation, North Tonawanda, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,533
Int. Cl.² B62D *21/14*
U.S. Cl. 180—9.3 **2 Claims**



1. A vehicle comprising a main body, a set of wheels on each side of said main body, a track assembly mounted between the two sets of wheels and under said main body, with said track assembly comprising amultiplicity of powered tracks that cover substantially the whole underside of said vehicle and that do not extend as far down as the wheels of said two sets of wheels,

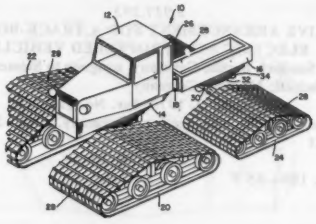
said vehicle further comprising drive means for individually driving said two sets of wheels in the same or in opposite directions at the same or at different speeds, driven means for driving each of said powered tracks, and differential drive means for transmitting power from said sets of wheels to said driven means of said tracks for causing each track to move with a ground speed that is intermediate the ground speeds of its two adjacent tracks or intermediate the ground speeds of its adjacent track and its adjacent set of wheels.

3,937,289

SNOW CAT

Lawrence Chapman Dickinson, 2255 Eva Adams, Reno, Nev. 89504

Filed Jan. 16, 1974, Ser. No. 433,940
Int. Cl.² B62D 11/00
U.S. Cl. 180—9.44 8 Claims



1. A snow cat comprising:

fore and aft substantially rigid body frame members;

an articulating joint joining the fore and aft body frame members, said articulating joint permitting relative rolling motion and relative yawing motion between said fore and aft body frame members;

four endless track assemblies, two of said track assemblies located on each side of the fore body frame member and the other two of said track assemblies located on each side of the aft body frame member, each said track assembly including a relatively wide endless track having a moving flat base portion adapted to ride over snow and means for maintaining said base portion in its substantially flat configuration;

a first axle interconnecting the two track assemblies located on each side of the fore body frame member and a second axle interconnecting the two track assemblies on each side of the aft body frame member; fore

spring means mounting the first axle to the f ore body frame member and the second axle to the aft body frame member; and

forward and aft stabilizer means, said forward stabilizer means comprising a first torsion bar interconnecting the track assemblies on each side of the fore body frame member to restrict relative vertical motion therebetween, said aft stabilizer means comprising a second torsion bar interconnecting the track assemblies on each side of the aft body frame member to restrict relative vertical motion therebetween.

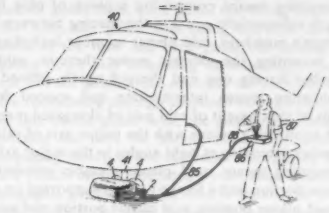
3,937,290

APPARATUS FOR MANOEUVRING AIRCRAFT

Vernon A. Benning, Maidenhead, England, assignor to M. L. Aviation Company Limited, England

Filed July 12, 1974, Ser. No. 488,812
Claims priority, application United Kingdom, Sept. 17, 1973, 43499/73
Int. Cl.² B60D 1/00
U.S. Cl. 180—14 C 2 Claims

1. Apparatus for manoeuvring twin nose-wheeled aircraft, said apparatus comprising a frame, at least one pair of ground wheels supporting said frame, means for fitting said frame to the wheel-supporting structure of an aircraft, a pair of driving drums, means mounting said drums to turn in said frame, said mounting means comprising means whereby said drums are slidable between a first position in frictional engagement with respective wheels of said aircraft and a second position in frictional engagement with said at least one pair of ground wheels, a source of power providing independent drive to said two drums, a separate control unit and a flexible connection



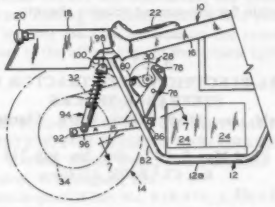
connecting said unit to said frame, whereby said two drums may be controlled.

3,937,291

MOTOR MOUNT FOR ELECTRIC POWERED MOTORCYCLE

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry, Inc., Somerville, Conn.

Filed Oct. 7, 1974, Ser. No. 512,418
Int. Cl.² B62D 61/02
U.S. Cl. 180—33 A 5 Claims



1. In an electric powered motorcycle having a frame including a pair of spaced frame members, storage batteries supported on the frame operable for powering the motorcycle, a front wheel, a rear wheel supported on a rear axle, and shock absorber means having one end connected to the frame and the other end operatively connected to the rear wheel and operable for enabling the rear wheel to move relative to the frame in passing over an obstruction in the path of movement thereof, the improvement comprising a motor mount assembly operable for mounting the electric motor of the electric powered motorcycle thereon for movement relative to the frame while the electric motor remains connected in electrical circuit relation with the storage batteries from which the electric motor receives its power and also remains operatively connected to the rear wheel for imparting drive thereto and thereby to the motorcycle, said motor mount assembly comprising:

a. a motor mount having one end thereof pivotably mounted on the frame of the motorcycle and the other end thereof supported on the rear axle of the motorcycle, said motor mount including a pair of side rails, a planar member and connecting means operable for interconnecting said side rails and said planar member for movement together as a unit, said pair of side rails comprising a pair of elongated members having one end thereof rigidly affixed to said connecting means in spaced relation relative to each other with said pair of elongated members extending in parallel relation to each other and with the major axis of each of said pair of elongated members extending at right angles to the major axis of said connecting means, each of said pair of elongated members being tubular in config-

uration and having a rectangular cross section, each of said pair of elongated members further including means formed thereon intermediate the ends thereof for attaching one end of the shock absorber means thereto, said connecting means comprising a piece of pipe having a length substantially equal to the spacing between the pair of frame members, said planar member including means for mounting the electric motor thereon, said planar member having one end thereof rigidly affixed to said connecting means intermediate and spaced from the point of attachment of said pair of elongated members to said connecting means with the major axis of said planar member extending at right angles to the major axis of said connecting means, said planar member consisting of a planar portion and a flange portion supported on one side of said planar portion, said planar portion and said flange portion each having one end thereof rigidly affixed to said piece of piping; and

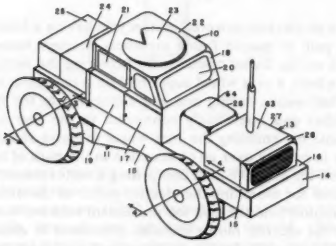
b. means securing said motor mount on the motorcycle to cause said motor mount whenever the rear wheel moves relative to the frame to move correspondingly, said securing means including a first member having said connecting means supported thereon, said first member comprising a solid rod positioned in said piece of pipe and having threads formed at each end thereof, means fastening one end of said first member to one of the pair of frame members and the other end of said first member to the other of the pair of frame members, and bushing means supported on said pair of elongated members adjacent the other end thereof operable for receiving the rear axle therewithin for movement relative thereto.

3,937,292

DIESEL-ELECTRIC WHEEL TRACTOR WITH STEERABLE TRUCKS

Elmo Kincaid, Jr., 1660 Ashley Drive, Clarkston, Wash. 99403

Filed May 2, 1974, Ser. No. 466,211
Int. Cl.² B60K *17/30*
U.S. Cl. 180—45 **1 Claim**



1. A wheel type electric powered tractor comprising, in combination:

a principal frame having an operator's cab containing operational controls and supporting an engine powering an electric generator;

forward and rearward trucks articulatively supporting the principal frame, each truck having at least one set of paired opposed wheels irrotatably carried on individual axles journaled therein for support of the vehicle on a supporting surface;

steering means associated with each truck;

plural electric drive motors, powered by the electrical output of the electric generator, carried on the trucks one associated with each wheel on each truck through mechanical linkage to drive the associated wheel;

control means activated by the operational controls to operate the steering means;

wherein the articulative support of the principal frame on at least one truck comprises ball and socket joinder means to allow relative motion between the principal frame and the truck in two mutually perpendicular planes;

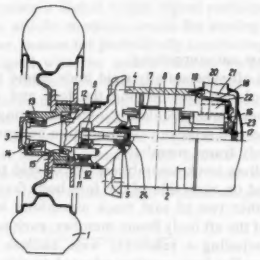
torus-like air cushion springs with metallic bearing plates operatively separating the trucks and principal frame about the ball and socket joinder means.

3,937,293

DRIVE ARRANGEMENT FOR A TRACK-BOUND ELECTRIC SELF-PROPELLED VEHICLE

Roman Susdorf, Berlin, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 3, 1974, Ser. No. 511,718
Claims priority, application Germany, Oct. 26, 1973, 2354301
Int. Cl.² B60K *7/00*
U.S. Cl. 180—65 F **4 Claims**



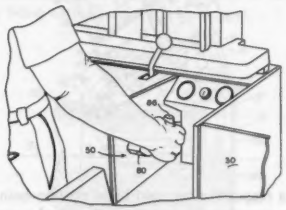
1. A drive arrangement for a track bound electric self-propelled vehicle having drive wheels comprising: a separate, high-speed electric motor for each of the drive wheels; a planetary gear assembly for transferring the energy developed by the motor to the drive wheel corresponding to said motor; a pinion constituting the sun gear of said planetary gear assembly; said motor including: a stator assembly incorporating a housing, and a rotor rotatably mounted in said housing for driving said pinion; said planetary gear assembly including: a stationary structure connectable to said housing, said stationary structure being the axle of the drive wheel as well as the planet carrier of said gear assembly, a plurality of planet gears each rotatably mounted on said structure and engaging said sun gear, and a ring gear also engaging said planet gears so as to be rotatable with respect to said structure; a hub for supporting thereon the drive wheel corresponding to said motor, said hub being fixedly attached to said ring gear; and, bearing means for bearing said hub on said stationary structure; said rotor having a rotor shaft for driving said pinion; said housing having a removable bearing shield at the end-face thereof facing away from said planetary gear assembly; said motor further including: a first bearing disposed in said bearing shield for accommodating a first end of said rotor shaft, said first bearing being configured as a fixed bearing; a second bearing supporting a second end of said rotor on said stationary structure, said second bearing being a loose bearing having an outer race fixedly connected to said stationary structure and an inner race fixed on said rotor shaft so as to be removable from said outer race when the rotor is axially withdrawn from said housing; and, a pluggable coupling removably interconnecting said pinion and said rotor shaft.

3,937,294

OPERATOR HAND CONTROL FOR INDUSTRIAL LIFT TRUCKS

Louis A. Haddock, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Sept. 26, 1974, Ser. No. 509,583
Int. Cl.² B60K 26/02
U.S. Cl. 180—77 R 17 Claims



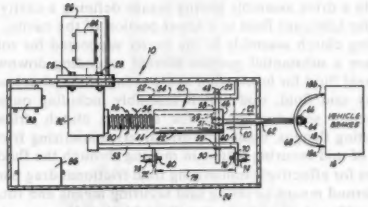
1. In an industrial truck having an operator's station of the stand-up type formed in a body portion of the truck, an operator's control handle mounted pivotally from its one end portion and extending from its said one end portion longitudinally of the truck, a rotatable operator's control member connected to one side of the end of the control handle which is remote from said pivoted end portion, said control member being rotatable in a plane substantially parallel to the vertical plane of the control handle on an axis substantially transverse of the truck, the operator's forearm being in a plurality of operator control positions in relation to the control handle functionally in or adjacent the vertical plane thereof, and the operator's hand palm being located generally in a vertical plane in facing relation to the control member.

3,937,295

BRAKE CONTROL APPARATUS FOR AUTOMATICALLY ENGAGING AND DISENGAGING THE PARK BRAKES OF A VEHICLE

Virgil Wright, Rte. 3, Huntsville, Ark. 72740

Filed Mar. 11, 1974, Ser. No. 449,630
Int. Cl.² B60T 7/12
U.S. Cl. 180—103 BF 9 Claims



1. A brake control apparatus for automatically engaging and disengaging the vehicle brakes in response to the positioning of the vehicle ignition switch in the on and the off positions, respectively, the brake control apparatus comprising:

a slide member connected to the vehicle brakes, including:

a tube, having a threaded opening extending a distance therethrough intersecting one end thereof forming an open end, the vehicle brakes being connected to a portion of the tube; and

a pair of guide arms, one end of each guide arm being connected to the tube and each guide arm extending a distance from the tube;

means for slidingly supporting the slide member for sliding movement in a brake engaging direction engaging the vehicle brakes and in a brake disengaging direction disengaging the vehicle brakes, including:

a pair of guide rails, each guide rail being disposed near the tube, the guide rails being disposed on opposite sides of the tube and each guide rail having an elongated guide slot extending therethrough, the end of each of the guide arms, opposite the ends connected to the tube, being slidingly disposed through the guide slot of one of the guide rails, the guide rails slidingly supporting the tube for sliding movement in the brake engaging direction and the brake disengaging direction;

forward switch means, actuated by the slide member in the disengaged position of the vehicle brakes, to switch the means moving the slide member from the actuated forward condition to the off condition;

reverse switch means, actuated by the slide member in the engaged position of the vehicle brakes, to switch the means moving the slide member from the actuated reverse condition to the off condition;

a power supply connectable to the means moving the slide member; and,

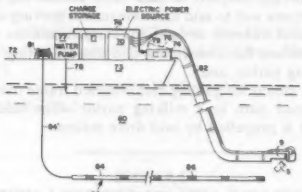
means connected to the ignition switch, the means moving the slide member, the forward switch means, the reverse switch means and power supply, for connecting the power supply to the means moving the slide member and positioning the means moving the slide member in the actuated forward condition in the closed position of the vehicle ignition switch, and connecting the power supply to the means moving the slide member and positioning the means moving the slide member in the actuated reverse condition in the off position of the vehicle ignition switch.

3,937,296

FIRING DEVICE, EXPLOSIVE CHARGE, METHOD, AND SYSTEM, FOR SEISMIC EXPLORATION

Richard R. Larson, Ulster Park, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 818,475, April 21, 1969, Pat. No. 3,574,298. This application Feb. 26, 1970, Ser. No. 14,321
Int. Cl.² G01V 1/38; F42D 3/06
U.S. Cl. 181—118 22 Claims



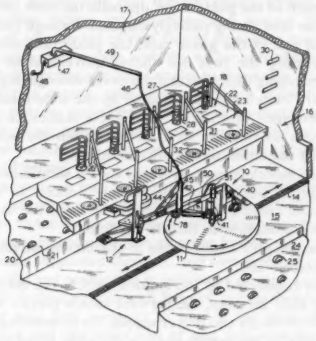
1. A firing device for initiating electrically initiatable seismic charges assemblies having a delay period intermediate initiation and detonation of same, and then delivering the initiated charge assemblies for detonation outside the system, which comprises means for sequentially directing said charge assemblies along a path of continuous forward travel for electrical initiation of same; contact means, at a forward point on said path of travel, for receiving electric current for electrically initiating said charge assemblies and disposed in a stationary position for intercepting contact with said charge assemblies as they travel along said path to transfer said current to said assemblies for initiation of same; and means in response to contact of said charge assemblies with said contact means for directing the thus initiated charge assemblies from said firing device during said delay period.

3,937,297

MILKING CHAIR APPARATUS

Hubert Hudson Jacobs, and Virginia Michael Jacobs, both of 1035 N. Hill Ave., DeLand, Fla. 32720

Filed Apr. 8, 1974, Ser. No. 458,906
Int. Cl.² A01K 1/12
U.S. Cl. 182—13 9 Claims



1. A mobile milking chair comprising in combination:

a. a wheeled frame having a platform supported by wheels attached thereto;

b. drive means for propelling said frame upon actuation by an operator;

c. operator seat means including at least one seat movably attached to said wheeled frame;

d. operator seat support frame attached between said seat means and a center support member and being movably supported on at least one other point on said platform whereby said chair can be shifted around said platform for positioning said seat, said seat support frame having a movable connection between portions thereof for moving one portion and said seat relative to another portion of said seat support frame;

e. drive means for moving said operator's seat relative to said wheeled frame upon actuation by an operator;

f. control means connected to said operator's seat means operatively coupled to said drive means for propelling said frame and to said drive means for moving said operator's seat whereby an operator can position the operator's seat means for connecting and disconnecting cows in a milking parlor; and

g. guide means for guiding said wheeled frame over a predetermined path in a milking parlor when said wheeled frame is propelled by said drive means.

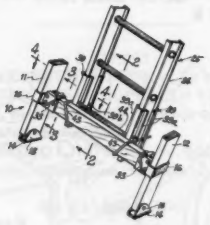
3,937,298

LEVELLING ATTACHMENT FOR LADDERS

Mathew Hurwitz, 63 Oakland Ave., Auburndale, Mass. 02166

Filed Apr. 16, 1975, Ser. No. 568,552
Int. Cl.² E06C 7/44
U.S. Cl. 182—200 2 Claims

1. An apparatus for supporting a ladder on an irregularly contoured surface comprising, a transverse member having end portions extending outboard of the side rails of said ladder, means for securing said transverse member to said side rails, a pair of legs, each being generally rectangular in cross section, a knuckle mounted on each end of said transverse member, each knuckle including an open ended socket portion generally rectangular in cross section and shaped to slidably receive one of said legs, each knuckle including a pair of channel ears integral with a socket portion and disposed in confronting relation to each other so as to embrace one end of said transverse member, each of said channel ears extending vertically beyond at least one horizontal edge of said socket portion with the extending portion of the channel ear providing a pair of vertical abutment edges in spaced confronting relation to a respective leg, latching means associated with each knuckle, each latching means including a camming bight portion disposed between a pair of vertical abutment



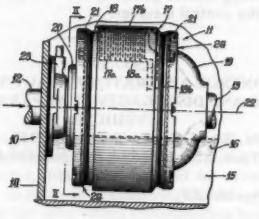
edges and a respective leg, said bight portion being manually rotatable to engage said abutment edges and a respective leg so as to cant said leg within said socket portion to frictionally bind said leg within said socket portion in an infinite number of adjusted positions.

3,937,299

BOLT HEAD SHROUD

Gerald D. Hardy, East Peoria; Eugene A. Plouzek, Washington, and James G. Starling, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 2, 1974, Ser. No. 494,310
Int. Cl.² F16N 7/00
U.S. Cl. 184—1 R 23 Claims



1. In a drive assembly having means defining a cavity, heat transfer lubricant fluid in a lower portion of the cavity, and a rotating clutch assembly in the cavity supported for rotation to have a substantial portion thereof extending downwardly into said fluid for lubrication and cooling of the clutch assembly by said fluid, said clutch assembly including outwardly projecting securing means for securing clutch drums to mounting flanges, means for effectively minimizing frictional drag of said securing means in moving through the fluid, said means for effectively minimizing fluid frictional drag comprising shroud means covering said securing means and rotatable therewith and providing a low fluid friction drag covering for said securing means.

3,937,300

REPLACEABLE LUBRICATING CARTRIDGE FOR SPLINE CONNECTIONS

Bennett W. Avery, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

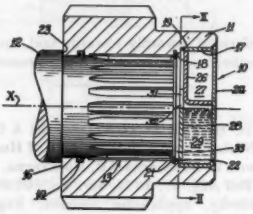
Division of Ser. No. 390,877, Aug. 23, 1973, Pat. No. 3,847,248. This application June 26, 1974, Ser. No. 483,163
Int. Cl.² F16N 9/02
U.S. Cl. 184—70 3 Claims

1. A replaceable self discharging lubricating cartridge

adapted for installation in the hollow end of a rotatable shaft or the like comprising

a housing having an annular outer wall and an end wall secured to one end of said outer wall to define a chamber therein,

first and second parition means secured to the other end of the annular outer wall of said housing to respectively separate said chamber into a closed first chamber portion and a substantially closed second chamber portion with said second chamber portion adapted to be at least partially filled with a liquid lubricant, and



means defining an opening through said second partition means between said second chamber portion and the exterior of said housing through which the lubricant may pass, said first partition means comprising a crescent-shaped member, having an L-shaped cross section, secured to said housing and defining therewith said closed first chamber portion therein and said second partition means comprising a crescent-shaped plate secured to said housing and defining therewith said second chamber, said opening defined through said plate.

3,937,301
TRAILER HAVING A SELF-LIFTING PLATFORM

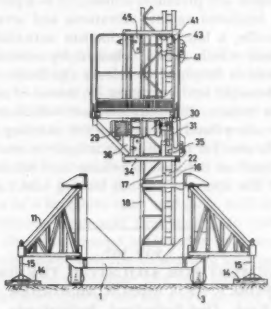
Philippe Bertail, 13, Avenue Rhin et Danube, 92350 La Garenne Colombes, France

Filed Mar. 18, 1974, Ser. No. 452,777

Claims priority, application France, Mar. 20, 1973, 73.09884

Int. Cl.² B66B *11/04*

U.S. Cl. 187—19 **7 Claims**



1. In a trailer having a self-lifting platform supported by a rack mechanism and guided along a vertical mast consisting of superimposable elements and supported by the trailer, the improvement comprising: two vertical lifting supports which are part of the mast, said lifting supports being spaced in the longitudinal direction of the trailer, a plurality of struts spanning the space between the two vertical lifting supports to join said lifting supports together in the mast, said struts being arranged in regular, vertically spaced intervals along substantially the entire length of the mast, each lifting support including two, spaced, vertical uprights, a toothed rack associated with each lifting support, each toothed rack including a plurality of flat rack teeth, one end of each rack tooth being coupled with one vertical upright of the associated lifting support, the other end of each rack tooth being coupled with the other upright of the associated lifting support, each rack tooth thereby spanning the space between two uprights of each lifting support, the rack teeth of each toothed rack being vertically spaced along the associated lifting support, said platform being provided with two, symmetric, independent lifting mechanisms including two roller stars which are in engagement with the two toothed racks.

3,937,302
OSCILLATING MOVEMENT DAMPING MEANS INTENDED FOR PIVOTALLY SUSPENDED HOISTING GEAR

Jan Birger Palmcrantz, Harmanger, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden

Filed Dec. 18, 1974, Ser. No. 533,796

Claims priority, application Sweden, Dec. 19, 1973, 7317130

Int. Cl.² F16F *7/08*

U.S. Cl. 188—1 B **11 Claims**

1. An improved oscillating movement damping means for a pivotally suspended hoisting device, comprising a link supporting said hoisting device, a first horizontal shaft pivotally mounting the upper end of said link to the outer end of a lifting means, such as crane jib, a second horizontal shaft pivotally mounting said hoisting device to the lower end of said link, the vertical longitudinal medium plane of said second shaft forming an angle, preferably a right angle, to the vertical medium plane of said first shaft, the improvement in which one of the pivoted members is provided with a sector-shaped brake disc at the pivot point of one shaft, said brake disc having its centre approximately in the centre of said one shaft, and the second pivoted member being provided with at least one brake shoe, and a spring arranged to press said brake shoe against said brake disc at a distance from said one shaft.

3,937,303
FRICTION PLATES

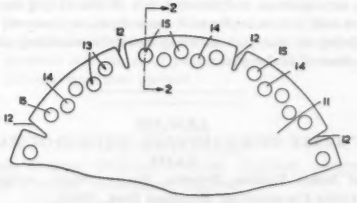
Brian Robert Allen, and Anthony William Harrison, both of Birmingham, England, assignors to Girling Limited, Birmingham, England

Filed May 17, 1974, Ser. No. 470,922

Claims priority, application United Kingdom, May 19, 1973, 23965/73

Int. Cl.² F16D *69/04*

U.S. Cl. 188—73.2 **4 Claims**



1. A friction plate including a metal backing plate and a plurality of friction pads carried by the backing plate on one surface thereof, all the friction pads on said one surface of the backing plate being contained in first and second, circular rows which extend around said one surface of the backing plate and which bound respectively first and second concentric, circular annuli, the external diameter of the first annulus

being less than the external diameter of the second annulus but greater than the internal diameter of the second annulus so that the annuli overlap, and the friction pads in each of said first and second rows having their centers disposed at a constant radial distance from the center of the backing plate, but the number of said friction pads in the second row exceeding the number of said friction pads in the first row.

3,937,304

DISC BRAKE CALIPERS

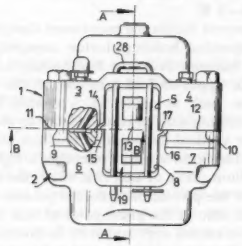
Hermann Brix, Koblenz, Germany, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 348,472, April 6, 1973, abandoned. This application Aug. 16, 1974, Ser. No. 498,179

Claims priority, application United Kingdom, Apr. 11, 1972, 16715/72

Int. Cl.² F16D *55/228, 65/00*

U.S. Cl. 188—73.5 **8 Claims**



1. An opposed piston disc brake caliper of the fixed type comprising two caliper halves, a machined surface being provided on each caliper half, a pad recess being formed in each machined surface, the caliper halves being clamped together with their machined surfaces engaging each other, the pad recesses together forming a friction pad locating aperture, and part of at least one of said machined surfaces being exposed at least at one side of the friction pad locating aperture whereby the exposed part of the at least one machined surface provides a datum surface for accurate measurement relative thereto, and a spring of generally rectangular configuration, a window aperture in said spring, and a laterally projecting tag being arranged on at least one side of the spring to engage against said datum surface of the caliper to correctly locate the spring in the pad locating aperture enabling accurate inspection of brake pad wear.

3,937,305

DISC BRAKE SHOE DAMPENER, METHOD OF MAKING SAME

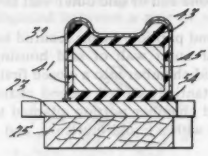
Daniel Julius Vanden Bossche, Frazer, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Oct. 3, 1974, Ser. No. 511,839

Int. Cl.² F16D *55/00, 65/00*

U.S. Cl. 188—73.5 **3 Claims**

1. Disc brake vibration inhibiting apparatus for a disc brake shoe of the type comprising a pad and a backing plate, said vibration inhibiting apparatus including a cup-shaped metallic member having the lip thereof inertia-welded directly to the backing plate, weight means within said cup-shaped metallic member, resilient means surrounding said weight means and insulating the same from the walls and bottom of said cup-shaped member, the bottom of said cup-shaped metallic member being deformed inwardly towards said backing plate to cause said resilient means to be in a compressed condition.



3,937,306

AUTOMATIC BRAKE ACTUATOR FOR A CHAIN SAW

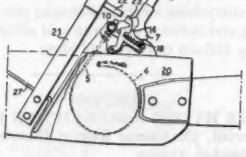
Ulf Vilhelm Näslund, and Egil Skog, both of Huskvarna, Sweden, assignors to Husqvarna AB, Huskvarna, Sweden

Filed Aug. 27, 1974, Ser. No. 501,082

Claims priority, application Sweden, Aug. 29, 1973, 7311717

Int. Cl.² B60T *13/04*

U.S. Cl. 188—166 **4 Claims**



1. A motor saw of the kind having a driven drum; a band brake around the drum; a pre-tensioned elastic means for supplying a tensioning force to the band; a resilient, fixed carrying handle insulated by elastic elements against vibration; a collapsible arm pivotably connected to a part of the saw which is not insulated against vibrations and arranged adjacent said handle; a latching mechanism actuatable by said collapsible arm which, when released by actuation of the collapsible arm, is arranged to release the brake so that the said band is brought into operation by means of said pre-tensioned elastic means, the improvement which comprises a projection means extending between the carrying handle and the collapsible arm for transmitting a force occurring upon a throw movement of the saw to release said latching mechanism without the operator's hands leaving said carrying handle.

3,937,307

ARRANGEMENT FOR ADJUSTING THE DAMPING FORCE OF A SHOCK ABSORBER

Cornelis de Kock, Oud-Beijerland, Netherlands, assignor to ITT Industries, Inc., New York, N.Y.

Filed Oct. 11, 1974, Ser. No. 514,172

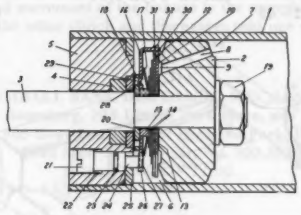
Claims priority, application Netherlands, Oct. 12, 1973, 7314047

Int. Cl.² F16F *9/34*

U.S. Cl. 188—319 **11 Claims**

1. An arrangement for adjusting the damping force on the piston of a hydraulic telescopic shock absorber, comprising a closed cylinder, a piston within said cylinder, a piston rod connected to the piston and extending outside the cylinder, a

closure member and valve operable together to restrict a passage through the piston, an adjusting member to control the closure member and thereby regulate the restriction of said passage, a stop member installed to extend through one end of the cylinder and axially movable between two end positions in the cylinder end, said stop member in one of the end positions engaging a recess of the adjusting member to



enable adjustment of the adjusting member, said stop member in the other end position being withdrawn from possible engagement with the adjusting member, said adjusting member supporting an axially directed part which is in engagement with a recess in the closure member to enable variation of restriction in the passage through the piston and thereby regulation of the damping force.

3,937,308

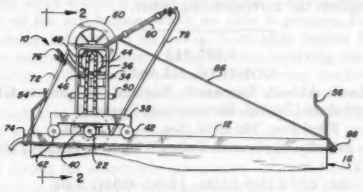
CABLE TAKE UP FOR TRAVERSING MECHANISMS

Eugene G. Sukup, Dougherty, Iowa 50433

Filed Feb. 23, 1973, Ser. No. 335,376

Int. Cl.[2] H02G *11/00*

U.S. Cl. 191—12.2 R **4 Claims**



1. Apparatus comprising a power unit which is movable back and forth along a predetermined path extending between first and second end positions; said power unit including a motor; a rotatable idler take-up reel supported on said power unit for movement therewith along said path; an elongated flexible power supply member having a first section secured adjacent said first end position, a second section fixed relative to said reel, and a further section between said first and second sections of a length to span said path, said further section extending directly from said first section to said power unit and in one direction around said reel to said second section; means on said power unit for connecting said second section of said power supply member and said motor; and a second elongated flexible member having a first section secured adjacent said second end position, and a further section of a length to span said path, said further section of said second member extending from said first section thereof directly to said power unit and in an opposite direction around said reel relative to said power supply member and being in drive engagement with said reel; whereby upon traversing movement of said power unit in either direction along said path, paying out of one of said flexible members from said reel will cause rotation of said reel and taking up of the other of said flexible members on said reel.

3,937,309

MULTIPLE SPEED HUB FOR A BICYCLE AND LIKE VEHICLE

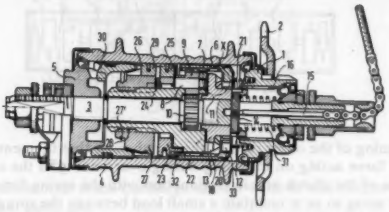
Horst Schulz, Friedrichshafen; Erich Hild, Schweinfurt; Werner Steuer, Oerlenbach; Karl-Heinz Schmidt, Schweinfurt; Ewald Eisend, Grafenrheinfeld; Karlheinz Löffler, Hassfurt; Josef Flösser, Schweinfurt, and Reinhard Kessler, Schweinheim, all of Germany, assignors to Fichtel & Sachs AG, Schweinfurt am Main, Germany

Filed July 10, 1974, Ser. No. 487,151

Claims priority, application Germany, July 25, 1973, 2337725

Int. Cl.[2] B06L *1/00*; F16H *3/44*

U.S. Cl. 192—6 A **5 Claims**



1. In a multiple speed vehicle hub including a driver member, a hub shell, and transmission means in said hub shell for rotating said hub shell at a plurality of alternative speeds when said driver member is rotated at a predetermined speed, the improvement in said transmission means which comprises:

a. first, second, and third transmission members mounted for rotation about a common axis and carrying respective first, second, and third coupling elements;

b. motion transmitting means connecting said second and third members for simultaneous rotation about said common axis at different speeds in axially spaced relationship, (1) each of said elements having a circumferentially directed engagement face;

c. shifting means for axially shifting said first member between two terminal positions in which the engagement face of said first element circumferentially abuts against the engagement faces of said second element and of said third element respectively during said rotation;

d. yieldably resilient means axially biasing one of said second and third members toward a normal relative position of said one member adjacent the other one of said second and third members,

1. the axial spacing of said second and third elements in said normal position of said second and third members being smaller than the axial length of said first element; and

e. cam means on said first element and on said second element cooperating for axially moving said first member into one of said terminal positions thereof in response to relative angular displacement of said first and second members while said first member is in an axial position spacedly intermediate said terminal positions thereof.

3,937,310

SPRAG CLUTCHES

Benjamin Duncan Oldfield, Cheadle, England, assignor to Renold Limited, Manchester, England

Filed Sept. 23, 1974, Ser. No. 508,708

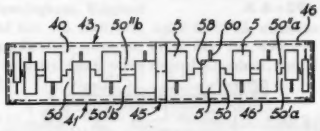
Claims priority, application United Kingdom, Sept. 29, 1973, 45640/73

Int. Cl.[2] F16D *41/07*

U.S. Cl. 192—41 A **21 Claims**

1. A sprag-retainer assemblage for use in an annular gap defined between confronting cylindrical surfaces of inner and outer races of a sprag clutch to transmit uni-directional drive between the clutch driving and driven race, the assemblage

comprising an annular sprag retainer, a ring of sprags in the retainer, and, for each sprag an energising spring individual to the sprag for biasing the sprag into substantially line contact with the inner race of the clutch, by tilting the sprag about substantially a line of contact with the outer race of the clutch, with a component of spring force directed radially inwardly of the assemblage, whereby the centrifugal force acting on the spring during overrunning of the outer race of the clutch, in use of the asemblage, relieves the spring force on the sprag, the centre of gravity of each sprag being disposed close to or in the radial axial plane of the assemblage containing said line of contact between said sprag and the outer race during over-



running of the outer race of the clutch such that the centrifugal force acting on the sprag during overrunning of the outer race of the clutch acts in conjunction with the spring force on the sprag so as to maintain a small load between the sprag and the inner race on overrun of the outer race, at least within a predetermined limit of outer race overrunning speed, in which the sprags and the energising springs are staggered whereby each pair of adjacent sprags of said ring of sprags are offset relative to one another axially of the assemblage, and likewise the pair of springs associated with them, the sprags being shaped and arranged to interengage with one another between the springs to limit the tilt of the sprags in the driving phase of the clutch.

3,937,311

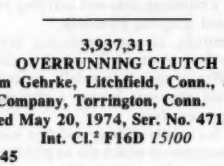
OVERRUNNING CLUTCH

Gerard William Gehrke, Litchfield, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed May 20, 1974, Ser. No. 471,204

Int. Cl.² F16D *15/00*

U.S. Cl. 192—45 **6 Claims**



1. In an overrunning clutch with an inner member and an outer member, the outside diameter of the inner member being less than the inside diameter of the outer member to provide an annular space between said members, one of said members having a roller member race and the other of said members having a cam surface, the improvement comprising: a pair of axially separated stops on said roller member race; a plurality of rolling members located between the pairs of stops and within the annular space between the inner member and the outer member; said rolling members filling said annular space and adapted to contact one another; and a spring axially located between one of the stops and the rolling members, said spring being in direct contact with at least one of the rolling members and adapted to urge said at least one of the rolling members in an axial direction against the other stop whereby the rolling members urged by the spring will be carried along with the roller member race and will be circumferentially moved by relative rotation of the inner member and outer member to move the rolling members along the cam surface.

3,937,312

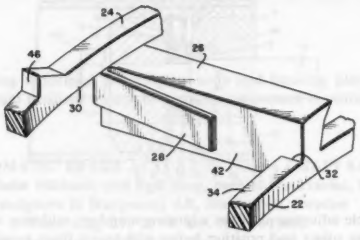
RETAINER FOR ROLLER CLUTCH

Gerard William Gehrke, Litchfield, Conn., assignor to The Torrington Company, Torrington, Conn.

Filed Oct. 4, 1974, Ser. No. 512,345

Int. Cl.² F16D *3/34*

U.S. Cl. 192—45 **6 Claims**



1. A retainer for an overrunning clutch comprising: a first molded plastic rim; a second molded plastic rim axially spaced from the first rim and having an inside diameter at least equal to the outside diameter of the first rim; a plurality of circumferentially spaced molded plastic bars interconnecting the two rims forming roller pockets; and a molded plastic spring connected to each of a plurality of the bars at a point adjacent the second rim and extending angularly from the second rim toward the first rim; the rims, bars, and springs being one integral member with each spring being adapted to be pressed toward its corresponding bar when a roller is placed in the corresponding pocket of the retainer so that each spring exerts a force against the corresponding roller.

3,937,313

CONTROL MEANS

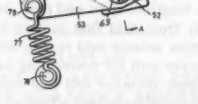
Randle Leslie Abbott, Tamworth, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Dec. 20, 1974, Ser. No. 535,091

Claims priority, application United Kingdom, Dec. 22, 1973, 59673/73

Int. Cl.² F16D *21/06, 19/00*; G05G *1/04*

U.S. Cl. 192—48.91 **10 Claims**



1. A control means comprising a fixed first member, two pivots fixed relative to the first member in spaced-apart relation, a second member movable relative to the first member, a third member movable relative to the second member by a first manually operated control between first and second positions in which respectively the third member engages the first and second pivots and thus mounts the second member for pivoting movement about the first and second pivots respectively, spring means acting on the second member and a

linkage connected to the second member in such a location that when the third member is in its first position the spring force urges the linkage in one direction and when the third member is in its second position the spring force urges the linkage in the opposite direction.

5. A clutch assembly comprising two clutches operated by a control means according to claim 1, the linkage being connected with the two clutches so that movement of the linkage in one direction engages one clutch and disengages the other clutch and movement of the linkage in the opposite direction engages the other clutch and disengages said one clutch.

3,937,314

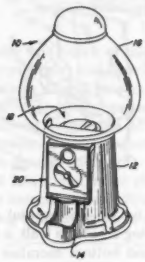
GUMBALL BANK DISPENSING MECHANISM

Phillip I. Rosenberg, 285 Linden Park Place, and Mervyn L. Keces, 505 Groveland, both of Highland Park, Ill. 60035

Filed Sept. 5, 1974, Ser. No. 503,353

Int. Cl.² G07F *11/00*

U.S. Cl. 194—63 **12 Claims**



1. A coin-operated article-dispensing machine, having a coin-receiving mechanism that permits operation of the mechanism when a coin is in the mechanism, and prevents operation of the mechanism when no coin is present, said coin-receiving mechanism including: front-plate means having a coin-receiving aperture; rotatable coin-receiving disc means adjacent said front-plate means and having pocket means therein for receiving coins inserted into said mechanism through said aperture; actuator means cooperatively associated with said disc for rotating said disc; means for preventing reverse rotation of said disc beyond a predetermined position; and means for selectively preventing forward rotation when no coin is in said pocket but permitting forward rotation when a coin is in said pocket, the improvement comprising said disc including integral peripheral finger means for cooperation in preventing reverse rotation of said disc, and having a terminal end portion which defines on axially-extending, abutment-shoulder means, said finger means being adapted to flex in the axial direction; and fixedly positioned shoulder defining means in axial relation to said disc and arranged for engagement by said abutment-shoulder means when said disc is rotated in the reverse direction, thereby preventing reverse rotation of said disc.

3,937,315

APPARATUS FOR HANDLING WORKPIECES

Joseph R. Reilly, Naugatuck, Conn., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 480,604, June 19, 1974, abandoned, which is a division of Ser. No. 424,866, Dec. 14, 1973, Pat. No. 3,880,301. This application Dec. 26, 1974, Ser. No. 536,416

Int. Cl.² B65G *47/38*

U.S. Cl. 198—131 **14 Claims**

1. Workpiece handling apparatus comprising:

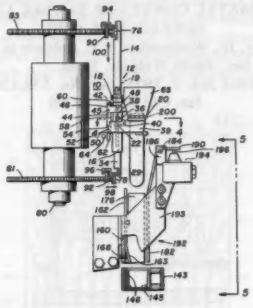
A. a plurality of carrier assemblies, each including:

a. a holder for supporting a workpiece; and

b. a trip mechanism for abruptly shifting said holder to a workpiece-release position;

B. means supporting said carrier assemblies for sequential movement along a longitudinal path through loading and discharge stations;

C. an actuating assembly for simultaneously triggering the trip mechanisms of a group of said plurality of carrier



assemblies at the discharge station while in said longitudinal path; and

D. trip mechanism reset means between the discharge and loading stations for returning the trip mechanisms to workpiece-engaging positions.

3,937,316

METHOD OF AND MEANS FOR COOLING SUPPORT TRAYS FOR HOT-PRESSED BOARDS

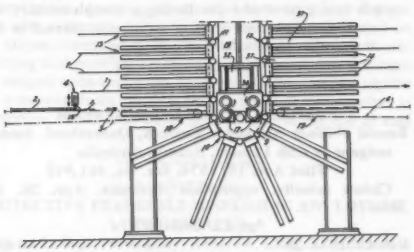
Klaus Gerhardt, Rheurdt, Germany, assignor to G. Siempelkamp & Co., Krefeld, Germany

Filed Mar. 10, 1975, Ser. No. 556,965

Claims priority, application Germany, Mar. 12, 1974, 2411660

Int. Cl.² B65G *17/12*

U.S. Cl. 198—156 **10 Claims**



1. A method of unloading and cooling a series of trays carrying flat, hot workpieces, comprising the steps of:

serially feeding hot trays loaded with workpieces on an input conveyor to the ascending side of a vertical transporter forming a multiplicity of peripherally separated tray-receiving stages moving in an endless path around an upper and a lower vertex;

upon the approach of a tray to said transporter, stripping the workpiece therefrom and temporarily retaining same on the input conveyor while advancing the tray into a confronting stage of the transporter;

after a movement of the trahsporter sufficient to align the input conveyor with a clearance between stages on the ascending side and a similar clearance on the descending side of the transporter, releasing the retained workpiece and passing same from the input conveyor through the aligned clearances onto an output conveyor on the descending side of the transporter; and

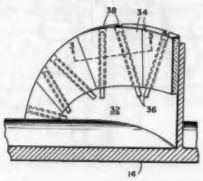
discharging the tray from its stage on the descending side after a travel around the upper vertex of the transporter.

3,937,317

COMPONENTS FOR WEAR-RESISTANT SURFACING HELICAL METAL CONVEYOR BLADES AND THE SO SURFACED BLADES

Leo W. Fleury, Jr., Woonsocket, R.I., assignor to Bird Machine Company, Inc., South Walpole, Mass.

Filed Jan. 2, 1975, Ser. No. 538,126
Int. Cl.² B65G 33/00
U.S. Cl. 198—213 7 Claims



1. Components for wear-resistant surfacing helical metal conveyor blades comprising:

a segment of wear-resistant surfacing material adapted for attachment in side-by-side relation with other like segments to a face of said blade to form a conveying portion thereof, said segment having a widthwise and radially outer end curvature conforming to that of the helix and diminishing in width from its outer end toward its inner end;

said segment having therein at least one groove extending through the inner end thereof and diagonally across the segment toward the outer end thereof;

and a bar of weldable metal for each said groove slidably fitting in the groove and of sufficient length to provide an end portion protruding from the inner end of said segment for welding to a face of said stub blade;

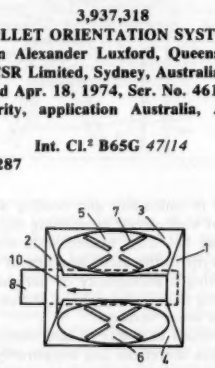
each said groove and bar having a complementary shape such as to prevent relative movement thereof in directions other than axially of said groove.

3,937,318

BILLET ORIENTATION SYSTEM

Ronald William Alexander Luxford, Queensland, Australia, assignor to CSR Limited, Sydney, Australia

Filed Apr. 18, 1974, Ser. No. 461,910
Claims priority, application Australia, Apr. 26, 1973, 3084/73
Int. Cl.² B65G 47/14
U.S. Cl. 198—287 4 Claims



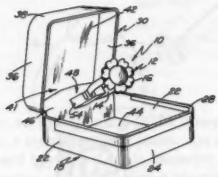
1. Apparatus for urging into a first orientation plane elongated billets having lengths within a predetermined range of lengths and falling under the influence of gravity in a randomly orientated stream of billets into the apparatus, said apparatus comprising a hopper having an open top, an open bottom, two side walls and two shorter end walls with at least said side walls converging toward said open bottom, the shortest distance between said side walls and the shortest distance between said end walls being respectively less than the shortest billet and longer than the longest billet in said predetermined range of billet lengths; a primary orientating means comprising two rotatable discs located between said hopper top and bottom, one in each side wall and generally co-planar therewith; at least one billet orientating vane on each said disc projecting into said hopper; and driving means to rotate the discs in opposite directions.

3,937,319

JEWELRY DISPLAY BOX

Armand W. Roy, Plainville, Mass., assignor to Royal Hinge & Die Company, Inc., Plainville, Mass.

Filed Sept. 17, 1973, Ser. No. 398,237
Int. Cl.² B65D 79/00
U.S. Cl. 206—45.13 6 Claims



1. A display box for an ornamental article, comprising a bottom member having a bottom wall, a top member hingedly interconnected to said bottom member for movement to an open or closed position relative thereto and having a top wall, a hinge joined to said top and bottom members, a mounting member for receiving said article thereon and located in said box adjacent to the axis of said hinge, means secured to said mounting member and responsive to movement of said top member for locating said article as received on said mounting member in a storage position within said top and bottom members when the box is closed, or in an upper exposed display position between said top and bottom members when the box is open, said mounting member including an elongated body portion, the longitudinal axis of which is perpendicular to the hinge axis of said top and bottom members, an extension of the longitudinal axis of said mounting member substantially bisecting the hinge axis of said top and bottom members, said locating means including a flexible insert covering at least the hinge that interconnects said members, said mounting member being secured to said flexible insert and projecting therefrom at substantially right angles thereto, and an opening formed in said flexible insert, said mounting member being received in said opening having a flange formed thereon that is located on the underside of said flexible member for preventing withdrawal of said mounting member through said opening.

3,937,320

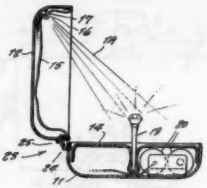
LIGHTED JEWELRY BOX

Albert L. Chao, and Ethel Chao, both of 407 Glendale Road, Northvale, N.J. 07647

Filed Aug. 12, 1974, Ser. No. 496,511
Int. Cl.² B65D 1/34; F21V 33/00
U.S. Cl. 206—75 1 Claim

1. A lighted box comprising a case, a cover pivotally attached to said case, said case having a rear wall and said cover having a rear wall; hinge means connecting the top of said rear wall of said case with the bottom of said rear wall of said cover with respect to said case; an insert fitted within said case for supporting an item; a fabric lining within an inner side of said cover; and means for illuminating said cover and case, said means comprising an electric circuit having a miniaturized lamp located within said cover, dry cell batteries contained in

said case under said insert, and a switch, said switch comprising a first clip having a U-shaped portion of a contact portion, and a second clip having a U-shaped portion and a contact portion, said top edge of said rear wall of said case having a notch formed therein for receiving said U-shaped portion of said first clip, said notch being situated to one side of said hinge means, and said bottom edge of said rear wall of said cover having a notch formed therein for receiving said U-shaped portion of said second clip, said notch of said cover



being situated opposite said notch of said case when the cover is pivoted to an open position, said contact portion of said first clip extending rearwardly of said case and said contact portion of said second clip extending rearwardly of said cover, whereby when the cover is pivoted to an open position to allow access to the inside of the box said contacts of said first and second clip abut against each other to close said electric circuit and light said lamp, and when the cover is pivoted to a closed position, the contacts of said first and second clips are moved out of abutting contact to open said electric circuit.

3,937,321

TOOTHPASTE

Thomas James Delaney, Piscataway, and William Grant Pierson, Flanders, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 295,094, Oct. 4, 1972, abandoned, and a continuation-in-part of Ser. No. 389,827, Aug. 20, 1973, abandoned. This application Nov. 28, 1973, Ser. No. 419,741

Int. Cl.[2] A61K *7/16*; **A45D** *40/00*

U.S. Cl. 206—84 **18 Claims**

1. A dental cream in an unlined aluminum tube, said dental cream containing an abrasive content comprising at least about 20% sodium bicarbonate in a vehicle containing sufficient liquids, said vehicle consisting essentially of about 5 to 35% water and sufficient viscous water miscible polyol humectant or mixtures thereof, and a sufficient amount of gelling or thickening agent to impart to the dental cream the pasty consistency, body and non-tacky nature which is characteristic of conventional dental creams or toothpastes, and over 1% silica dissolved or dispersed therein, said sodium bicarbonate being primarily in the undissolved solid state, said dental cream having a granular textured appearance comprising a substantially dispersed non-crystalline appearing granulate of macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix.

3,937,322

PACKAGE FOR DISPOSABLE PIPETTE TIPS

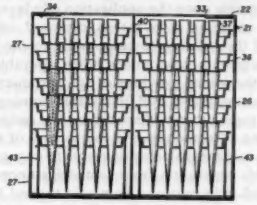
Jules Barry Cohen, Brooklyn, N.Y., assignor to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

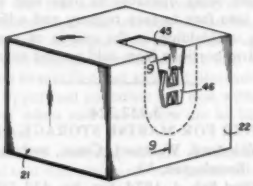
Filed June 17, 1971, Ser. No. 154,143

Int. Cl.[2] B65D *79/00*, *85/62*

U.S. Cl. 206—216 **3 Claims**

1. A package of pipette tips comprising a first tray having a plurality of apertures through which pipette tips can project, a first group of tapered pipette tips projecting through the apertures of said first tray, each tip having abutment means projecting outwardly from the outer surface thereof to support the tip on said first tray so that a part of said tip projects through its associated aperture, a second tray having a plurality of apertures through which pipette tips can project, said second tray being supported above said first tray by said first group of pipette tips, a second group of tapered pipette tips projecting through the apertures of said second tray, each tip having abutment means projecting outwardly from the outer surface thereof to support the tip on said second tray so that a part of said tip projects through its associated aperture, the location of said abutment means and the taper of said pipette tips being such that the tips carried by said second tray project





into but do not touch the internal walls of the tips carried by said first tray, carton means containing said stacked trays of pipette tips, said carton means having means to accommodate a member for removing pipette tips from frictional engagement with a pipette, and a tip removal member mounted on said carton means, said tip removal member having means mounting said member on said carton means and a rectangularly shaped open-ended slot for receiving the end of a pipette with a removable tip thereon, the thickness of said member at the bottom of said slot being greater than at the top of said slot.

3,937,323

PROTECTIVE FRANGIBLE DISPENSING ENCLOSURE FOR ARTICLE

Zsigmond L. Sagi, Parsippany; Robert A. Lang, East Hanover; Jimmie D. Scott, Parsippany; Berel Weinstein, Fort Lee, and Charles G. Pickett, Andover, all of N.J., assignors to Bio-Medical Sciences, Inc., Fairfield, N.J.

Continuation of Ser. No. 402,006, Sept. 1, 1973, abandoned. This application Jan. 28, 1974, Ser. No. 437,035

Int. Cl.[2] B65D *17/24*, *85/16*; **B32B** *35/00*

U.S. Cl. 206—306 **14 Claims**

1. A package for the complete and protective enclosure of the components of a partially assembled laminated product and the dispensing of the fully assembled product, said components including at least two elongated coextensive strips joined along first portions in face-to-face relationship and intervened along their remaining second face portions by a

peelably separable shield operable to prevent face-to-face contact of said second portions prior to dispensing, said package comprising

A. a hollow housing of rigid or semi-rigid material, said housing

1. having opposed spaced apart main side walls and end walls defining a continuous surface fully enclosing said components and

2. being divided into two segments by a band intermediate to said end walls, said band being defined in said side walls by a section of sufficiently reduced thickness to permit the frangible separation of said housing into two segments upon the application of a levering force,

B. product engaging stop means disposed on the inside surface of the housing corresponding to the first of said housing segments, said means being operable to engage and stop the joined portions of said product from complete withdrawal from said first of said housing segments.

C. shield engaging means disposed on the inside portion of the housing corresponding to the second of said housing segments, said means being operable to engage said shield for peelable separation from said strips upon removal of said second strip portions from said second housing segment following frangible separation of said housing, and

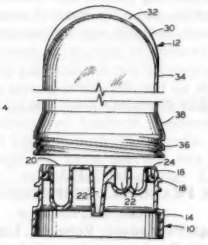
D. pressing means disposed in that portion of the housing corresponding to the second of said housing segments, said means being operable to urge said unjoined strip portions into face-to-face registry and adhesive contact following unshielding in the course of removal of said second strip portions from said second segment.

3,937,324

CONTAINER FOR MARINE STORAGE OF TOOLS

Carlton L. Whiteford, Westport, Conn., assignor to Creative Tools, Inc., Bennington, Vt.

Filed Feb. 4, 1974, Ser. No. 439,290
Int. Cl.² B65D *85/54*
U.S. Cl. 206—349 **8 Claims**



1. In a container for waterproof storage of tools and the like, the combination comprising:

A. an integral base having a substantially rigid platform disposed centrally at the upper end thereof, an externally threaded circular portion adjacent the upper end thereof, and a resiliently deflectable upstanding annular lip thereabove extending axially upwardly in spaced relationship outwardly of said platform portion thereof with an annular upwardly opening channel being defined therebetween; and

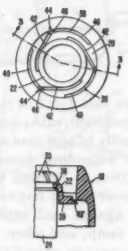
B. an elongated cover open at the lower end thereof and having an internally threaded circular lower end portion threadably engaged on the externally threaded portions of said base, said cover also having an interior annular shoulder surface above the threaded portion thereof bearing upon, and deflecting said lip of said base inwardly into said channel and providing sealing contact therewith.

3,937,325

CARTRIDGE WITH LOCK STABILIZATION

Thomas W. Dodge, Boulder; Helfried O. Rinkleib, and William J. Rueger, both of Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 5, 1974, Ser. No. 494,939
Int. Cl.² B65D *85/67*
U.S. Cl. 206—387 **11 Claims**



1. In a cartridge for storing and handling a flexible wound web, said cartridge including in combination:

a base member, a cover member and locking means for releasably locking said members in a closed position;

said base member comprising a hub having a first and second end and adapted for winding a web thereon;

said cover member being generally cupshaped with a disk end portion extending radially around a central annular opening, said cover defining a web-receiving chamber around said hub when said base and cover members are in a closed position;

said locking means including a locking shoulder integral with the annular opening in the disk portion of said cover member and a plurality of flexible locking fingers integral with the second end of said hub, said fingers and said shoulder normally cooperating in locking engagement to secure said base and cover together in a closed position, said locking shoulder and locking fingers being disengageable to permit separation of said base member from said cover member, wherein the improvement comprises:

at least one non-radial aperture generally around said disk portion of said cover member to provide stabilization to the locking means to substantially prevent unintentional disengagement due to kinetic shocks.

11. In a cartridge for storing a wound web, said cartridge including in combination a cover member, a base member, and locking means for releasably locking said members together to form a web-receiving enclosure, the improvement wherein the locking means comprises:

an annular locking shoulder carried by a disk in said cover member;

a plurality of flexible latching fingers secured to said base member; and

at least one non-radial aperture generally around said disk in said cover member.

3,937,326

PRODUCT DISPLAY CARTON

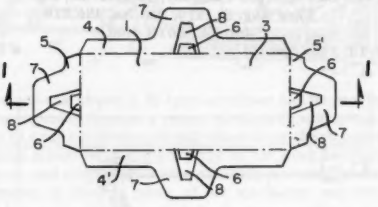
Andre Schick, Chemin du Martinet 5 bis, 1016 Lausanne (Vaud), Switzerland

Filed July 5, 1974, Ser. No. 486,061

Claims priority, application Switzerland, July 18, 1973, 10611/73

Int. Cl.² B65D *73/00*

U.S. Cl. 206—465 3 Claims



1. A product display carton comprising in combination a cardboard base sheet of oblong configuration including fold lines to facilitate folding the edges of the sheet upwardly to define a central rectangular article receiving portion, each side of said central portion provided with a projection and a turned up edge, the median part of each of said sides including a trapezoidal shaped tab provided with a central slot, a blister of transparent heat molded plastic including a top wall, side walls and an open bottom, a tongue extending outwardly from each of said side walls and fitted into a related central slot in one of said tabs, said tongue being of generally conical shape and forming an external cup-shaped protuberance, the opening of the cup being located on a level with the edge of contact of said blister with the cardboard base sheet, the edge of said opening provided with a flange for reinforcement thereof, said flange being in contact with the projection on the cardboard base sheet.

3,937,327

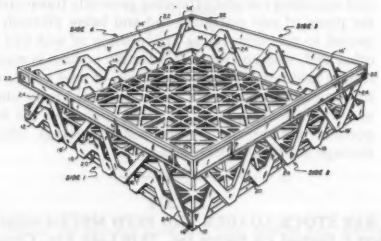
NESTING AND STACKING CONTAINERS

James C. Carroll, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 29, 1974, Ser. No. 492,834

Int. Cl.² B65D *21/04*

U.S. Cl. 206—507 10 Claims



1. A symmetrical nesting and stacking container comprising:

a generally horizontally disposed bottom; and

a plurality of adjacent dissimilar wall structures extending upwardly to essentially the same height from adjacent essentially equal length peripheral segments of said bottom located around the periphery of said bottom; with each of said wall structures comprising:

a sinuously shaped border flange extending along said peripheral segment of said bottom in a first vertical plane located adjacent said peripheral segment;

said border flange comprising a series of upstanding alternating peaks and valleys along its upper surface and a series of inverted alternating peaks and valleys along its lower surface, with the apex areas of said inverted peaks comprising a first plurality of spaced apart stacking feet located in said first plane, and the apex areas of said upstanding peaks comprising a first plurality of spaced apart stacking saddles located in said first plane;

an upper rim disposed generally vertically above said border flange and in a third vertical plane which is adjacent but outside a second vertical plane described hereinafter;

a plurality of spaced apart bar members, disposed in said second vertical plane which is adjacent but outside said first vertical plane, and extending in an upwardly inclined direction between the outer surface of said border flange and the inner surface of said upper rim;

the bottom of each of said bar members comprising a stacking foot in a second plurality of spaced apart stacking feet located in said second plane, and the top of each of said bar members comprising a stacking saddle in a second plurality of spaced apart stacking saddles located in said second plane;

the location, arrangement, and lateral spacing of said first feet and said first saddles with respect to each other and to said second feet and said second saddles, together with the location, arrangement, and lateral spacing of said second feet and said second saddles with respect to each other and to said first feet and said first saddles being such that an upper said container will nest within a like lower container when said containers are in like positions of orientation;

said second feet and said second saddles in at least two opposed said wall structures being adapted to register and to support an upper said container in a first stacked relationship on a like lower container when said upper container is rotated from said position of like orientation to a first station of rotation; and

said first feet and said first saddles in at least two opposed said wall structures being adapted to register and to support an upper said container in a second stacked relationship on a like lower container at a lower elevation than that of said first stacked relationship when said upper container is further rotated to a second succeeding station of rotation.

3,937,328

SUSPENDED CARTON WITHIN A CARTON

Robert Louis Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

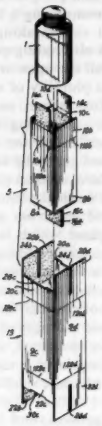
Filed Sept. 23, 1974, Ser. No. 508,550

Int. Cl.² B65D *81/02*, *85/30*

U.S. Cl. 206—521 3 Claims

1. A package which comprises a sealed first carton of foldable material and having side walls and end flaps foldably connected thereto, a sealed second carton surrounding said first carton, said second carton of foldable material and having side walls and end flaps foldably connected thereto, connecting tabs foldably connected to opposite end flaps of said first carton, portions of said connecting tabs congruently abutting each other, said second carton having aligned slotted portions in the end flaps thereof, said portions of connecting tabs

congruently abutting each other extending through said aligned slotted portions and the terminal portions of said



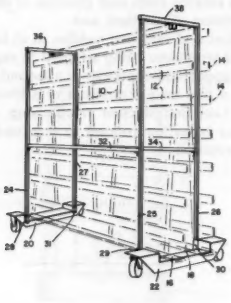
connecting tabs folded to lay within a parallel plane to the end flaps of said second carton and attached thereto.

3,937,329

SHEET GLASS SUPPORTING RACK

James T. Hammerel, Emeryville, Calif., assignor to Cobbledick-Kibbe Glass Company, Oakland, Calif.

Filed Aug. 12, 1974, Ser. No. 496,499
Int. Cl.² A47G *19/08*
U.S. Cl. 211—41 **5 Claims**



1. A rack for supporting rectangular sections of sheet products comprising:

an A-frame defining opposite downwardly divergent inclined sides;

means located adjacent the base extremities of each inclined side for engaging the bottom edges of and supporting the primary weight of sheet products stacked thereon, said stacked sheet products adapted to normally lean toward and against an adjacent inclined side of said A-frame;

at least one substantially vertical columnar member disposed to each side of said A-frame and spaced laterally from the sheet products on said frame; and

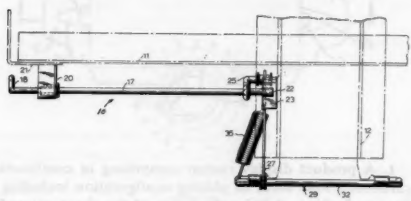
laterally projecting support means provided on each side of said A-frame for supporting each said columnar member at its base in a location spaced laterally outwardly from the base extremities of its adjacent inclined side, whereby sheet products supported on said A-frame can be successively tilted from their leaning position toward and against an adjacent inclined side to a leaning and substantially upright position toward and against an adjacent columnar support.

3,937,330

UNCOUPLING DEVICE FOR ROTARY COUPLERS ON FREIGHT CARS

Leonard A. McLean, Jacksonville, Fla., assignor to Seaboard Coast Line Railroad Company, Jacksonville, Fla.

Filed Aug. 8, 1974, Ser. No. 496,019
Int. Cl.² B61G *1/08*
U.S. Cl. 213—166 **6 Claims**



1. In a railway car having a coupler mounted for rotation relative to the car and having a locklift assembly linkage which, when turned, causes the knuckle of the coupler to be unlocked, a rotor element depending from the locklift assembly linkage beneath the head of the coupler, a bail having side arms and a connecting arm portion, the upper ends of the side arms being rotatably received in bearing member on opposite side faces of the center sill of the car and with the connecting arm adjacent the rotor element, the bail being urgable through a manually operated leverage arrangement, to swing from a rest position to a position where the arm portion contacts and turns the rotor element so as to turn the locklift assembly linkage and cause the knuckle to be unlocked, the improvement in the manually operated leverage arrangement which comprises:

A. An operating rod having a handle portion for manual grasping, said operating rod being rotatably mounted between spaced bearings lying adjacent a corner of the car and on said center sill thereof, said operating rod as so mounted extending inwardly from its handle portion at the car corner and lying in a plane between the bail and an end sill of the car; and

B. A mechanical linkage intergrally connected at one end to said operating rod and extending generally transversely to the plane of said operating rod and being pivotally connected to said connecting arm portion of said bail at its other end, whereby when said handle portion is manually turned said connecting arm portion of said bail is urged from a rest position into contact with said rotor element and with a force greater than that applied to the handle portion due to the mechanical advantage obtained through the mechanical linkage.

3,937,331

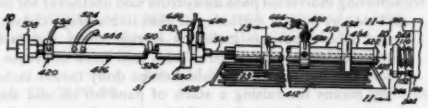
BAR STOCK LOADER AND FEED MECHANISMS

Robert J. Spercel, c/o Sperco Inc., 7810 Lake Ave., Clevelend, Ohio 44102

Continuation-in-part of Ser. No. 262,544, June 14, 1972, Pat. No. 3,814,299. This application Aug. 20, 1973, Ser. No. 389,731. The portion of the term of this patent subsequent to June 4, 1991, has been disclaimed.
Int. Cl.² B23Q *5/22*
U.S. Cl. 214—1 PB **19 Claims**

1. An apparatus comprising a chuck operable between an open condition and a closed condition in which said chuck is effective to grip bar stock, chuck actuator means for effecting

operation of said chuck between the open and closed conditions, feed means for feeding bar stock to said chuck, said feed means including gripper means operable between a closed condition in which said gripper means securely grips the bar stock and an open condition in which said gripper means is ineffective to grip the bar stock, gripper actuator means for effecting operation of said gripper means between the open and closed conditions, means for moving said gripper means through a feed stroke with said gripper means in its closed



condition and said chuck in its open condition and for moving said gripper means through a return stroke with said gripper means in its open condition and said chuck in its closed condition, loader means for moving a piece of bar stock into said feed means, and control means for effecting operation of said loader means to move a piece of bar stock into said feed means when said gripper means is in the open condition and for rendering said loader means ineffective to move a piece of bar stock into said gripper means when said gripper means is in the closed condition.

3,937,332

DEVICE FOR MOVING LONG AND THIN BODIES INTO NARROW SPACES, ESPECIALLY FOR CONTROL TURN-OFF BARS OR THE LIKE OF CORE REACTORS

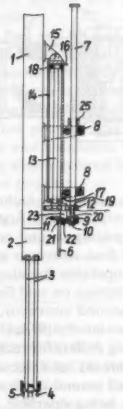
Hinrich Flessner, and Ulfert Paeserack, both of Wilhelmshaven, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Germany

Filed Feb. 21, 1974, Ser. No. 444,462

Claims priority, application Germany, Feb. 21, 1973, 2308533

Int. Cl.² B66C *19/00*

U.S. Cl. 214—1 P **6 Claims**



1. A device for moving long and thin bodies into narrow spaces, comprising

vertically displaceable gripper means to which the upper ends of long and thin bodies can be coupled holder means guided to be displaceable along said gripper means downwards and upwards,

power operable means attached to said gripper means and associated with said holder means for lowering and lifting it,

guiding means at the lower end of said holder means attached to said holder means in such a manner that it can be moved from an ineffective first position into a second position in which it supports in lateral direction the lower ends of said long and thin bodies when the latter are coupled to said gripper means but allowing upward and downward movement of said bodies relative to it,

actuating means connected to said power operable means and associated with said guiding means for moving it from said first position into said second position and vice versa.

3,937,333

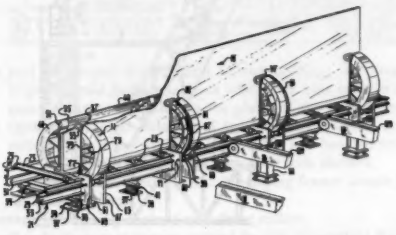
APPARATUS FOR LAYING DOWN STRUCTURAL MEMBERS

Roy G. Tucker, Whitman; Ernest G. Fruzzetti, North Abington; Charles R. Ribak, Stoughton, and Russell C. Bricknell, South Braintree, all of Mass., assignors to General Dynamics Corporation, St. Louis, Mo.

Filed Sept. 9, 1974, Ser. No. 504,049

Int. Cl.² B21B *39/30*

U.S. Cl. 214—1 Q **6 Claims**



1. Apparatus for laying down structural members having cross sections of substantial depth, comprising, means defining at least one recess having an open top side for receiving and supporting a member in an upright position, a first conveyor for moving the structural members into said recess, said recess being of a depth less than the depth of the member's cross section to leave a portion of the member projecting from the recess through the open top side, said recess defining means including a bottom plate and a pair of substantially parallel side plates supported spaced a fixed distance from each other, a second conveyor for moving the member in a direction away from said recess defining means substantially normal to the direction of movement of said first conveyor, and means for rotating said recess defining means about a substantially horizontal axis which lies substantially parallel with the direction of movement of said first conveyor and in a plane normal to the direction of movement of said second conveyor to move the projecting portion of the member in said recess into engagement with said conveyor to be moved out of said recess on said conveyor, said second conveyor being positioned at an elevation with respect to said recess defining means such that, after rotation of said recess defining means, the one of said side plates closest to said second conveyor is inclined with respect thereto to allow the member to slide out of said recess and onto said second conveyor.

3,937,334

PIPE HANDLING DEVICE

Donald Louis Bleyl, and John Dowe Irons, both of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Filed Feb. 3, 1975, Ser. No. 546,775

Int. Cl.² E21B *19/14*

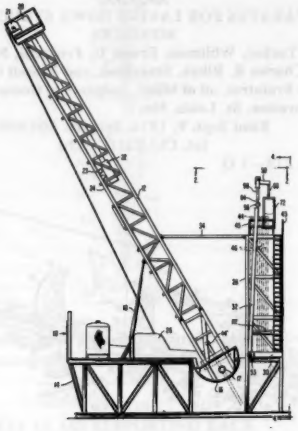
U.S. Cl. 214—2.5 **16 Claims**

1. In a slant-type drilling rig assembly having a base, a generally vertical conduit storage means, drawworks, drilling mast positioning means, and an inclinable drilling mast with a crown block, travelling block, and guide means therefor, an improved conduit transfer apparatus for moving conduit sections between the inclinable drilling mast and generally up-

right storage positions in the conduit storage means, comprising:

frame means being pivotally mounted to the drilling rig assembly and operable to move between a position adjacent the conduit storage means and another position adjacent the drilling position adjacent the drilling mast;

conduit holding means having a grappling means suspended therefrom, being pivotally attached to the frame means on a horizontal axis, and being operable to engage an



upper portion of a conduit section during transfer between the conduit storage means and the drilling mast whereby the conduit holding means and an associated conduit section are free swinging with a generally vertical orientation during conduit transfer; and

operator control station means suspended from the frame means for trapeze-like movement relative thereto about a horizontal axis, being operable to support and carry an operator for the conduit transfer apparatus and having a generally vertical orientation during conduit transfer.

3,937,335

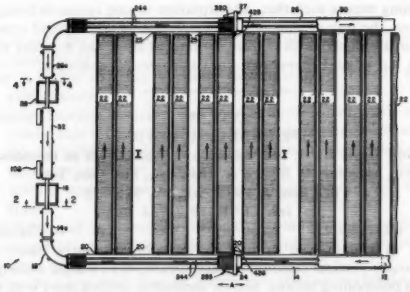
AUTOMATIC BREAD PAN CONTROL SYSTEM

William E. Lanham; William E. Lanham, Jr., and Gene C. Miller, all of Decatur, Ga., assignors to Lanham Machinery Company, Inc., Atlanta, Ga.

Continuation-in-part of Ser. No. 243,074, April 11, 1972, abandoned. This application Jan. 19, 1973, Ser. No. 325,108

Int. Cl.[2] B65G *60/00*

U.S. Cl. 214—6 DS **29 Claims**



1. A pan handling apparatus comprising an infeed conveyor for supplying individual pans to the apparatus, a storage station at which stacks of pans may be stored, pan stacker means for receiving said individual pans from the infeed conveyor and placing said pans in a stack, stack conveyor means for transporting the formed stack from said stacker means to said storage station, means for selectively removing stacks of pans from said storage station and supplying the stacks to an unstacking station, pan unstacker means at said unstacking station for receiving said stacks of pans and sequentially removing individual pans therefrom, and feed conveyor means for transporting individual pans away from said unstacker for use;

said storage station including at least one storage conveyor and said apparatus including storage dolly means for transferring a stack of pans from said stack conveyor to said storage conveyors; said storage dolly means including means for raising a stack of pans off of said stack conveyor and means for pushing said stack transversely of said stack conveyor onto to said storage conveyor; said pushing means including a rigid arm mounted on said storage dolly for reciprocating movement across said stack conveyor, towards and away from said storage conveyor, means for reciprocating said arm and means on said storage dolly for determining movement of said arm into a predetermined position adjacent said storage conveyor and for reversing said reciprocating means to return said arm to a predetermined position remote from said storage conveyor.

3,937,336

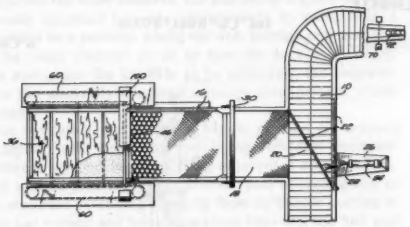
PALLETIZING AND DEPALLETIZING APPARATUS FOR SUPPLEMENTAL FEED

Kenneth G. Carlson, 11350 N. Valley Drive, 18 W., Mequon, Wis. 53092

Filed Oct. 23, 1974, Ser. No. 517,263

Int. Cl.[2] B65G *60/00*

U.S. Cl. 214—6 P **4 Claims**



1. In conveying apparatus including a first conveyor for conveying containers between first and second stations, the improvement comprising second conveyor means in communication with said first conveyor at a communication zone, means selectively operable for diverting the containers coming from said first station on said first conveyor from said first conveyor to said second conveyor, a sweep bar and pattern-forming means associated with said second conveyor, a pallet elevator for carrying pallets for receiving containers from said second conveyor means, said second conveyor means being operable in first and second modes with said conveyor means in said first mode being operable with said pattern-forming means to form patterned container complements and convey the patterned complements to said pallet elevator for palletizing of the complements, and being operable in a second mode to convey containers from pallets in said elevator to said first conveyor in a conveying direction counter to the conveyor direction of said second conveyor in said first mode to supply containers to the second station, and wherein said pattern-forming means includes a pattern forming bar, and including means for reciprocating said sweep bar and pattern forming bar in the flow path of containers between said second conveyor and said pallet elevator in concert for movement from a position over said second conveyor to a position over said

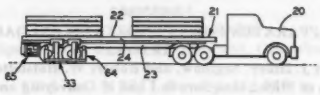
pallet elevator, means for detachably connecting said sweep bar and said pattern-forming bar for independent reciprocating movement of said sweep bar for depalletizing cans from pallets carried in said pallet elevator, and means for elevating the detached pattern forming bar during the depalletizing operation above the flow path of cans moved by said sweep bar onto said second conveyor from said pallet elevator.

3,937,337

VEHICLE MOUNTED LOADER AND UNLOADER

Joseph F. Irving, Rte. 2, Continental, Ohio 45831

Filed May 14, 1974, Ser. No. 469,797
Int. Cl.² B60P *1/48*
U.S. Cl. 214—80 **28 Claims**



1. Load transfer mechanism adapted for mounting on the side of a vehicle having a width limit and adapted for the transfer of load articles between the vehicle bed and a location adjacent the vehicle comprising:

a base attached to the side of the vehicle;

a sub-base;

an inner boom having first and second ends;

a first pivotal coupling between said inner boom first end and said sub-base;

means mounting said sub-base for movement relative to said base over a range of motion which includes a first position in which said first pivotal coupling and said inner boom first end are within said vehicle width limit and beneath the vehicle bed and a second position in which said first pivotal coupling and said inner boom first end are located beyond the width limit of said vehicle;

first operating means for driving said inner boom around said first pivotal coupling;

an outer boom having first and second ends;

a second pivotal coupling between said inner boom second end and said outer boom first end, said second pivotal coupling being spaced from said outer boom second end a distance within the width limit of the vehicle when said sub-base is in said first position and being spaced from said inner boom first end a distance less than the height of said first coupling above ground level when said sub-base is in said second position;

means attached to said outer boom second end for engaging load articles to be transferred; and

second operating means connected to said outer boom and adapted to drive said outer boom second end in an arc around said second pivotal coupling.

3,937,338

MULTI-PURPOSE VEHICLE FOR HAULING BULK MATERIAL OR DISCRETE PACKAGES

Joe L. Cox, 1096 E. First St., Pomona, Calif. 91766

Filed June 25, 1973, Ser. No. 373,368
Int. Cl.² B60P *1/38*
U.S. Cl. 214—83.36 **4 Claims**

1. In a vehicle for hauling trash and solid waste material, the combination of:

a vehicle body including a body frame structure, an uninterrupted floor on said structure, and upstanding side walls;

a continuous uninterrupted sheet of anti-friction material secured to and substantially completely covering said floor and presenting a smooth top surface from side wall to side wall;

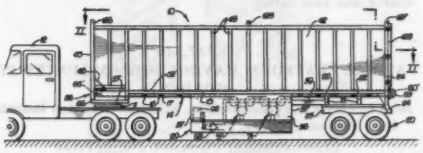
said anti-friction material being non-reactive to trash and waste material to be hauled;

an endless belt means of reinforced neoprene material having a top lay slidably movable along and supported on the major portion of the top surface of said anti-friction material and having a bottom lay movable beneath said floor;

idle rollers at opposite ends of the floor for supporting said endless belt means in non-driving engagement;

said body frame structure including depending frame means centrally between ends of said body frame structure for supporting belt drive means;

and drive means for said belt means supported by said depending central frame means below said floor and including



a pair of spaced drive rollers having surfaces frictionally engaging said bottom lay and with their axes lying in the same plane and parallel to the plane of the bottom lay,

a third drive roller below and between said pair of drive rollers and over which said bottom lay has frictional contact for more than 180° about the axis thereof,

a motor means carried by said depending frame means for said drive means,

means for driving each of said drive rollers,

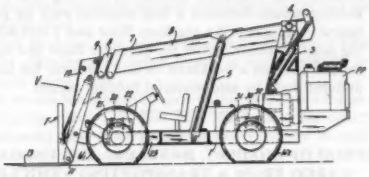
and reduction gear means carried by said depending frame means connecting said motor means and said means for driving said drive rollers.

3,937,339

VEHICLE HAVING TRANSVERSE LEVELING MEANS

Warren P. Geis, and Reinald D. Liegel, both of Port Washington, Wis., assignors to Koehring Company, Milwaukee, Wis.

Continuation of Ser. No. 193,807, Oct. 29, 1971. This application Nov. 5, 1973, Ser. No. 412,916
Int. Cl.² E02F *3/36*
U.S. Cl. 214—140 **22 Claims**



1. A self-propelled loading vehicle having means for vertically positioning a load with respect to the vehicle body, said means comprising an extensible boom pivotally mounted about a horizontal axis on said body, ground engaging means for supporting the vehicle body for movement over undulating terrain, power means between the ground engaging means and the vehicle body for tilting the vehicle body in a transverse direction relative to the ground engaging means and thereby maintaining the body in a substantially level transverse position regardless of the attitude of the ground engaging means in respect thereto, and automatic level sensing means for sensing deviation of the body from a transverse level position and for actuating said power means to maintain said body in a substantially level transverse position, said level sensing means including an electric circuit having an electrical power source, a fluid flow control valve, first level sensing switch means operatively responsive to a tilting of the vehicle body

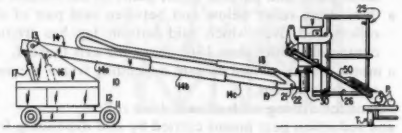
in a transverse direction a first predetermined amount, second level sensing switch means operatively responsive to a tilting of the vehicle body in a transverse direction a second predetermined amount, said second amount being significantly smaller than said first amount, a first system control switch for selectively completing and interrupting a circuit including said first level sensing switching means, said electric power source and said valve, a second system control switch independent of said first system control switch for selectively completing and interrupting a circuit including said second level sensing switch means, said electric power source and said valve, circuit means ensuring the operating effectiveness of said second level sensing switch means when both first and second level sensing switch means are in circuit with said electric power source and said valve.

3,937,340

AERIAL PLATFORM HAVING BOOM MOUNTED PIPE HOLDER

John L. Grove, Greencastle, Pa., assignor to Fulton Industries, Inc., McConnellsburg, Pa.

Filed June 14, 1974, Ser. No. 479,438
Int. Cl.² B66F 11/04
U.S. Cl. 214—147 G 21 Claims



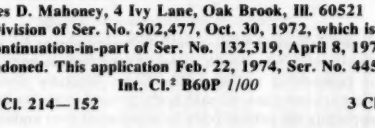
15. Aerial platform apparatus comprising:
a base and a boom mounted on said base for luffing movement in a vertical plane,
means for luffing said boom,
a platform comprising a floor and having the rear portion thereof adjacent the outer end of said boom,
means for connecting said platform to said boom for pivotal movement about a horizontal axis,
material holding means, and
means carried from said boom for supporting said material holding means and for selectively moving said material holding means between a first material pick up position below or adjacent the platform floor and a second working position remote from the platform floor and in which second position a workman on said platform has access to material held by said material holding means.

3,937,341

METHOD OF LOADING, HANDLING AND UNLOADING CARGO FROM A TRANSPORTING VEHICLE

James D. Mahoney, 4 Ivy Lane, Oak Brook, Ill. 60521

Division of Ser. No. 302,477, Oct. 30, 1972, which is a continuation-in-part of Ser. No. 132,319, April 8, 1971, abandoned. This application Feb. 22, 1974, Ser. No. 445,283
Int. Cl.² B60P 1/00
U.S. Cl. 214—152 3 Claims



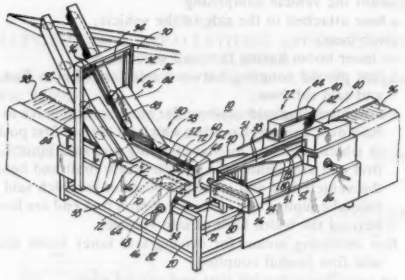
1. A method of unloading cargo elements from a supporting surface on a transporting vehicle and loading cargo elements onto said surface as said vehicle proceeds along a drop-off and pick-up route having a plurality of stops, said supporting surface having front and rear ends and longitudinally extending laterally spaced sides, said method comprising the steps of providing at least one path on said surface for guiding the direction of movement of cargo elements moving on said surface, said path extending lengthwise of said vehicle and having a receiving end at the rear end of said supporting surface and a discharge end in one of said sides and adjacent to the front end of said supporting surface, unloading cargo elements from the discharge end of said path as said vehicle makes its respective stops, loading cargo elements onto said path at the receiving end thereof as said vehicle makes its respective stops, and inertially moving cargo elements on said path from the receiving end toward the discharge end of said path until a predetermined number of cargo elements have been dropped off and picked up.

3,937,342

APPARATUS FOR OPENING AND UNLOADING CARTONS

Delbert J. Ittner, Saginaw, and Robert W. Hofstetter, Fenton, both of Mich., assignors to I and H Conveying and Machine Company, Clio, Mich.

Filed July 22, 1974, Ser. No. 490,681
Int. Cl.² B65G 65/04
U.S. Cl. 214—304 11 Claims



1. An apparatus for opening the flaps of a carton filled with articles and for unloading the articles from the cartons comprising:
first conveyor means for moving the cartons in a first direction;
carton outer flap folding means associated with said first conveyor means for folding the outer flaps of the carton from a closed position over the opening to the carton to a folded position away from their closed position as the cartons move in said first direction;
second conveyor means for moving the cartons in a second direction disposed at a predetermined angle to said first conveyor means;
carton inner flap engaging and folding means associated with said second conveyor means for folding the inner flaps of the carton from a closed position over the opening to the carton to a folded position as the cartons move in said second direction;
transfer means disposed between said first conveyor means and said second conveyor means for transferring said cartons from said first conveyor means to said second conveyor means; and
third conveyor means disposed adjacent the end of said second conveyor means and extending upwardly away therefrom whereby to remove the cartons from said second conveyor, the articles remaining on said second conveyor means; and
said second conveyor means comprises a pair of spaced apart second drive means disposed on opposite sides of said carton inner flap engaging and folding means to move the cartons in said second direction; said inner flap engaging and folding means comprising a pair of parallel

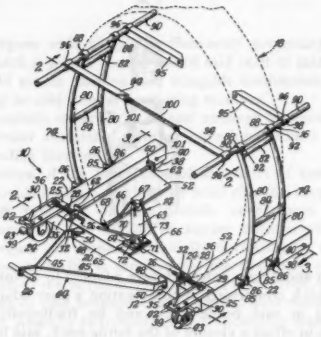
spaced apart downwardly and inwardly inclined support plates which permit the inner flaps to partially open a predetermined amount by folding downwardly under the influence of the weight of the articles in the carton; an elongated horizontal plate having its leading corners inclined downwardly and outwardly to engage the inner flaps as the carton moves from said support plates onto said horizontal plate and to support the articles in the carton as the carton moves in said second direction; and a generally V-shaped inner flap folding plate disposed beneath said horizontal plate having its apex facing against said second direction of movement and having its sloping edges extending toward opposite longitudinal sides of said horizontal plate.

3,937,343

ADJUSTABLE TIRE CART

Reynold Spulak, NW. on U.S. 81 - Box 948, Columbus, Nebr. 68601

Filed Nov. 9, 1973, Ser. No. 414,265
Int. Cl.² B65G 7/00
U.S. Cl. 214—332 **7 Claims**



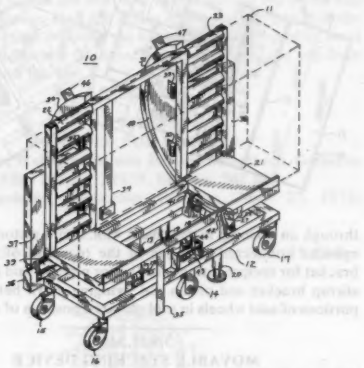
1. An adjustable tire cart for handling various size and type tires, comprising a frame having a center section and two lateral sections, said lateral sections being spaced apart and extending perpendicularly from the ends of said center section, each of said lateral sections having a perpendicular extension at one end thereof, said perpendicular extensions telescopically engaging said center section to permit adjustment of the spacing between said lateral sections for accommodating various tires, tire lifting means on said frame for engaging and raising or lowering a tire, said tire lifting means including an actuating member mounted on said frame, a pair of pivotable flap members mounted on said lateral sections, and adjustable length linkage connecting said actuating member to said flap members, said adjustable linkage including two lengths of chain, each of said lengths of chain having a first connection connected to one of said flap members and a second connection connected to said acutating member, and at least one of said first and second connections including means for engaging a selected link of the length of chain extending between said connections.

3,937,344

APPARATUS FOR TRANSPORTING AND HANDLING LARGE LOADS OF BUILDING MATERIALS

Thurman Rex Montgomery, deceased, late of Hurst, Tex., and by Billie Jo Montgomery, executrix, 2017 Hurstview Drive, Hurst, Tex. 76053

Filed Oct. 31, 1974, Ser. No. 519,439
Int. Cl.² B60P 1/28
U.S. Cl. 214—505 **6 Claims**



1. An apparatus for transporting a load through narrow passageways and unloading the load at a desired location, comprising:

a base frame,

wheel means connected to said base frame for allowing said base frame to be moved,

an upper frame positioned above said base frame, said upper frame having a lower load receiving portion normally positioned substantially parallel to said base frame and an unloading section projecting substantially perpendicular upward from said load receiving portion,

said upper frame having curved members extending convexly away from said unloading section of said upper frame,

hinge means between said curved members and said unloading section,

means between said base frame and said curved members for allowing said upper frame to move relative to said base frame, and

lock means for selectively preventing said upper frame from moving relative to said base frame and for selectively allowing said upper frame to move relative to said base frame and unload said load.

3,937,345

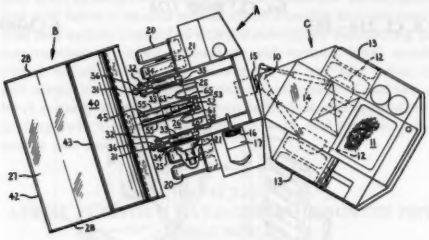
SHOVEL LOADER WITH EJECTOR BUCKET

Donald L. Countryman, Gresham, Oreg., assignor to Wagner Mining Equipment, Inc., Portland, Oreg.

Filed Nov. 15, 1974, Ser. No. 524,067
Int. Cl.² B60P 1/04
U.S. Cl. 214—510 **5 Claims**

1. A shovel loader comprising a vehicle frame supported by wheels on its opposite sides, drive means for said wheels providing an open space between said wheels free of an interconnecting axle, a loader bucket in front of said wheels having bottom, side and back walls and a scooping lip on the front end of said bottom wall, hinge pins pivotally mounting said bucket on said frame adjacent the lower portion of said back wall at the back end of said bottom wall, hydraulic cylinder and piston means connected between said frame and the upper portion of said back wall for pivoting said bucket to move said scooping lip between a depressed digging position

and an elevated dumping position, said bottom wall being inclined upward toward its front end in said dumping position, a transverse ejector plate in said bucket, a stirrup bracket extending rearward from said back wall and hinge pins into said open space between said wheels, a hydraulic cylinder mounted on the rear side of said ejector plate and extending



through an opening in said back wall, and a piston rod in said cylinder connected to a pin in the rear end of said stirrup bracket for reciprocating said ejector plate in said bucket, said stirrup bracket and piston rod swinging down between lower portions of said wheels in said elevated position of said bucket.

3,937,346

MOVABLE STACKING DEVICE

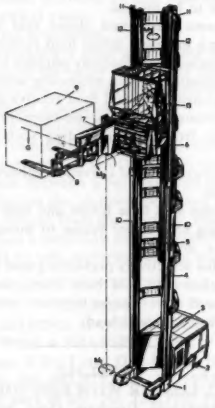
Hans Robert van der Laan, Kamerik, Netherlands, assignor to Cubic Handling Systems N.V., Belgium

Filed Sept. 4, 1974, Ser. No. 503,103

Claims priority, application Netherlands, Sept. 7, 1973, 7312385

Int. Cl.² B66F 9/14

U.S. Cl. 214—730 **10 Claims**



1. A movable stacking device comprising a substructure, a vertical mast vertically arranged thereon and composed of a fixed outer frame and an inner frame vertically guided by the outer frame, an operating platform vertically guided by the inner frame and comprising a base frame extending transversely to the substructure, a rotation head horizontally guided by the base frame and a fork means adapted to carry a load and being supported by the rotation head for rotation about a vertical shaft, the outer frame and the inner frame of the mast each consisting of two spaced channel or I-beam sections extending transversely to the substructure, the webs of said sections extending in longitudinal direction of the substructure, rollers or similar means being mounted on the sections of one frame which act on flanges of the adjacent sections of the other frame of the mast and further rollers or similar means being mounted on the operating platform which act on the flanges of the inner frame, characterized in that the outer frame and the inner frame each comprise in addition a vertical box girder, said box girders being arranged on behind the other on the longitudinal axis of the substructure, the box girder of the inner frame being vertically movable relative to the box girder of the outer frame by means of a guide means, but being unable to move transversely thereto, that the sections are each connected to the corresponding box girder by rigid transverse beams and that the side of the operating platform remote from the base frame comprises additional rollers or similar means cooperating with a vertically extending guide rail on the box girder of the inner frame.

3,937,347

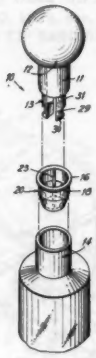
APOTHECARY SAFETY CLOSURE

Hugh Cottingham, Orange, N.J., assignor to Black Hole Nebula Incorporated, Orange, N.J.

Filed Mar. 27, 1975, Ser. No. 562,515

Int. Cl.² B65D 55/02, 55/56; A61J 1/00

U.S. Cl. 215—213 **7 Claims**



1. An apothecary safety closure adapted to be inserted in a bottle neck comprising in combination a liner adapted to be inserted in said bottle neck and be frictionally engaged thereby to effect a closure of the bottle neck, said liner defining a recess therein, said recess including first operative means disposed on said liner for effecting removal of said liner from said neck, and a stopper including an elongated cylindrical wall portion adapted to be inserted into said liner recess and be rotatable with respect thereto, said cylindrical wall including second operative means adapted to be selectively aligned with said first operative means disposed on said liner in response to selective rotation of said stopper to effect a removal of the liner from said bottleneck by said stopper.

3,937,348

SECURITY BOTTLE CLOSURE DEVICE

Piergiacomo Guala, Alessandria, Italy, assignor to Angelo Guala S.p.A., Alessandria, Italy

Filed Mar. 5, 1975, Ser. No. 555,902

Claims priority, application Italy, Mar. 7, 1974, 67627/74

Int. Cl.² B65D 41/34, 41/36, 41/38

U.S. Cl. 215—252 **2 Claims**

1. In a closure device for bottles of the type having a screw thread at or adjacent the end of the neck thereof and means forming a radial shoulder facing away from the mouth of the bottle, said closure device comprising

a cap having an elongate skirt,

an internal screw thread on said skirt of said cap, said internal screw thread cooperating with the screw thread on the neck of a bottle when said cap is screwed thereon, and

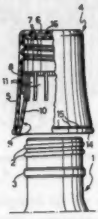
a tubular anchoring member fitted within said skirt of said cap below said internal screw thread thereof, said tubular anchoring member having an inner diameter greater than the outer diameter of the radial shoulder on the neck of a bottle on which the closure device is to be fixed,

means forming a frangible connection between said tubular anchoring member and said skirt of said cap, and

a plurality of resilient tongues on said tubular anchoring member, said resilient tongues extending away from said rim of said skirt of said cap and being shaped such that their free ends lie in a circle the diameter of which is less than the outer diameter of the radial shoulder on the bottle to which the cap is to be fixed, so as to engage there against,

the improvement wherein:

said tubular anchoring member is formed at the end thereof opposite that from which project said resilient



tongues with a radially outwardly projecting flange which is joined to said rim of said skirt of said cap by said means forming said frangible connection of said cap to said tubular anchoring member,

the radially outer faces of said resilient tongues of said tubular anchoring member have longitudinal ribs extending therealong,

a portion of the inner face of said skirt of said cap is provided with a plurality of axial ribs for cooperation with said ribs on said radially outer faces of said tongues of said tubular anchoring member when said tongues are displaced radially outwardly as the said closure device is screwed for the first time onto the neck of the bottle onto which it is to be fixed, until the ends of said tongues engage against said radial shoulder, whereby to transmit to said anchoring member the torque applied to said cap upon screwing said closure device onto said neck of said bottle.

3,937,349

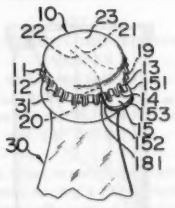
SELF-OPENING CROWN CAP

Shih Hsu, No. 34, Tien Suei Road, Taipei, China /Taiwan

Filed Sept. 11, 1974, Ser. No. 504,920

Int. Cl.² B65D *41/32*

U.S. Cl. 215—254 **6 Claims**



1. An easy-opening crown cap for closing the open end of bottles and the like, wherein the crown cap is of the type having a substantially flat top and a depending annular skirt of crimped configuration having alternate raised and depressed portions, a downwardly and outwardly inclined tongue on the cap projecting below a bottom edge portion of the skirt, said tongue having a plurality of longitudinally extending reinforcing ribs of a length slightly greater than the crimps in the skirt, and a lower end edge portion of the tongue being warped to reinforce the tongue, said cap having a pair of circumferentially spaced apart notches extending upwardly from a lower edge of the skirt in registry with opposite edges of the tongue, and a pair of weakened score lines extending upwardly from the notches across the skirt and across the flat top of the cap a distance greater than the radius of the cap but less than the diameter thereof, whereby the tongue may be grasped by hand and lifted to fracture the score lines and remove the cap from the bottle and the like.

3,937,350

STOPPER FOR BOTTLES

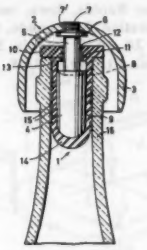
Hans Völker, Wolfsgrubengasse 2/c, 854 Schwabach, Germany

Filed Mar. 27, 1975, Ser. No. 562,564

Claims priority, application Germany, Mar. 27, 1974, 2414667

Int. Cl.² B65D *39/12*

U.S. Cl. 215—361 **15 Claims**



1. A stopper for bottles, especially for closing uncorked wine and champagne bottles, which includes: an elastic deformable sleeve member having a mantle section and a closed bottom section and an open top section, said top section of said sleeve member comprising a radially outwardly extending flange for placement onto the neck end face of the bottle to be closed and also comprising a radially inwardly extending flange, and a handle member coaxially arranged with regard to said sleeve member and comprising a cap and an inner member including a rigid longitudinally extending cylindrical piston and a connecting rod rigidly connecting said piston to said cap, the outer diameter of said piston being slightly less than the inner diameter of the bottle neck portion to be closed by said stopper, and the wall thickness of said sleeve mantle section in non-deformed condition of said sleeve member being greater than the thickness of the annular gap between the outer periphery of said piston and the bottle neck section of the bottle to be closed by said stopper.

3,937,351

PRESSURE VESSELS

Shepherd Rigg, Warrington, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Oct. 19, 1973, Ser. No. 407,957

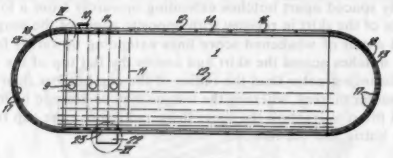
Claims priority, application United Kingdom, Oct. 25, 1972, 49221/72

Int. Cl.² B65D *7/44*

U.S. Cl. 220—3 **2 Claims**

1. A cylindrical pressure vessel comprising a central barrel portion and two part spherical end portions, the vessel being provided with means for preventing dispersal of vessel fragments in the event of the vessel being breached, said means comprising a first group of circumferential chains lying side by

side along the barrel portion and a second group of axially extending chains on top of said first group of chains, each said chain comprising a plurality of plates which are pivotably



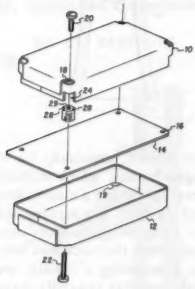
interconnected to each other but are unconnected to the vessel surface, said means further comprising end enclosures overlying the part spherical end portions and retained in position by the second group of chains.

3,937,352

PLURAL COVER MOUNTING ARRANGEMENT

Leo R. Kalous, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 24, 1975, Ser. No. 598,903
Int. Cl.² H02G *3/08*
U.S. Cl. 220—3.94 **4 Claims**



1. An arrangement for mounting two covers on opposite surfaces of a plane, comprising:

a first cover having a top and a side wall for defining a completely enclosed space when mounted on one of the surfaces of the plane, said top having at least two apertures adjacent said wall which align with apertures in the plane when mounted;

at least two elongated fastening nuts, each having a threaded shaft and a pair of grooves along its long axis;

at least two bolts for affixing said first cover to the plane by engaging the threaded shafts of said fastening nuts via the aligned apertures of said top and the plane;

a second cover having a top and a side wall for defining a completely enclosed space when mounted on the other surface of the plane, its top having at least two apertures adjacent its wall which align with the apertures in the plane when mounted and its wall containing at least two notches below the apertures for mating with said fastening nuts by slideably engaging the grooves, and

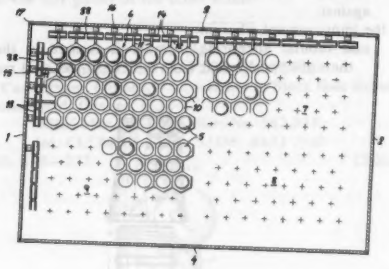
at least two more bolts for affixing said second cover to the plane by engaging the threaded shafts of said fastening nuts via the apertures in the top of said second cover.

3,937,353

SYSTEM FOR THE TRANSPORTATION OF LOW-TEMPERATURE FLUIDS

Rudolf Becker, Munich, and Max Bräutigam, Tacherting, Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Sept. 26, 1973, Ser. No. 400,806
Claims priority, application Germany, Sept. 27, 1972, 2247220; Apr. 3, 1973, 2316607
Int. Cl.² B65D *87/24*; B63B *25/08*
U.S. Cl. 220—9 LG **23 Claims**



1. A conveyance for the transport of a low-temperature fluid, especially a liquefied gas, comprising:

a thermally-insulated cargo compartment having a plurality of lateral vertical walls including two mutually angularly adjoining walls;

at least one fluid container received in said compartment, said fluid container comprising a multiplicity of generally similar neighboring receptacles secured together and defining a pair of flanks each juxtaposed with one of said mutually angularly adjoining walls; and

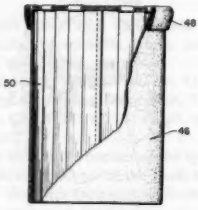
respective assemblies anchoring said container to said mutually angularly adjoining walls at each said flank with freedom of movement of the respective flank parallel to the juxtaposed wall but rigidly connecting the respective flank to said juxtaposed wall against displacement of said flank perpendicularly thereto, said fluid container being free from attachment to the vertical walls of said compartment other than said two mutually angularly adjoining walls.

3,937,354

APPARATUS FOR THE COMPACTION OF REFUSE MATERIAL AND THE LIKE

Milton Clar, 9408 Linden Ave., Bethesda, Md. 20014

Division of Ser. No. 261,325, June 9, 1972, Pat. No. 3,861,296.
This application Jan. 14, 1974, Ser. No. 433,042
Int. Cl.² B65D *25/14*; B30B *15/06*
U.S. Cl. 220—63 R **5 Claims**



1. Apparatus for lining a bag comprising a cylindrically tubular member having a top and a bottom, said member

being split longitudinally from top to bottom into separate overlapping parts, said parts being connected at said top only, by flexible connecting means.

3,937,355

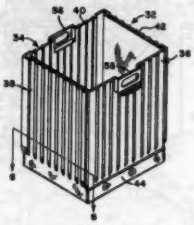
REMOVABLE LINER FOR TRASH COMPACTORS

Einar O. Engebretsen, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Division of Ser. No. 184,038, Sept. 27, 1971, Pat. No. 3,807,299. This application Mar. 6, 1974, Ser. No. 448,620

Int. Cl.[2] B65D *25/14*

U.S. Cl. 220—63 R 5 Claims



1. A composite liner adapted to be positioned within an open-top receptacle of a trash compactor for the receipt and downward compaction of trash therein:

a. a pair of separate liner sections,

b. each of said liner sections being open-topped and lidless and including a bottom wall and first and second upstanding walls,

c. said first walls of each section being substantially higher than said second walls of each section,

d. said bottom and upstanding walls of said liner sections being formed integrally with each other and providing substantially liquid proof containers adapted to hold liquid therein up to the level of the tops of said second walls thereof,

e. one of said liner sections being smaller than the other of said liner sections,

f. the smaller of said liner sections being positioned in nested but unattached relationship with the other of said liner sections with said bottom wall of said smaller section overlying and being in contact with said bottom wall of said other section, said second wall of said smaller section underlying a lower portion of said first wall of said other section and edge portions of said first wall of said other section overlapping edge portions of said first wall of said smaller section, and

g. said liner sections being readily separable manually by relative tilting movement thereof to facilitate removal of trash therefrom and complete separation of each of said liner sections from the other for cleaning purposes.

3,937,356

SANITARY RAIL STRUCTURE FOR FOOD PRODUCTS VESSEL

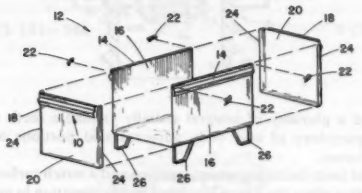
Jacob Schmidt, Sr., and Jacob Schmidt, Jr., both of R.D. No. 1, Harleysville, Pa. 19438

Filed Apr. 10, 1975, Ser. No. 566,741

Int. Cl.[2] B65D *7/42*

U.S. Cl. 220—73 1 Claim

1. A longitudinal sheet metal food vessel comprised of a U-shaped first member having a planar bottom and a pair of laterally disposed vertically extending planar side panels of similar height wherein each of said side panels is integrally formed from the material of said bottom respectively through the curvature of a relatively short radius 90° bend made at the respective lateral limits of said bottom and having also as second members a respective pair of non-integral generally planar end panels of said similar height and otherwise corresponding in complementary geometrical configuration to the opposite longitudinal ends of said U-shaped first member by each of said end panels having respectively integral thereto a flush plurality of flange edges comprised of an inwardly bent bottom flange and a corresponding pair of respective inwardly bent side flanges integrally joined to said bottom flange thereof by respectively formed quarter-hemisphere end panel bottom corner flanges wherein the curvature of all of said end panel bends are complementary to said relatively short radius 90° bend and wherein also each of said second member panels are thereafter weldably connected along said flush plurality of flange edges thereof to the respective longitudinal side, bottom, and corner ends of said U-shaped first member to form an open top container having corners which are curved upon said relatively short radius 90° bend in cross section, in combination with reinforcing means integral to the upper edges of said side and end panels comprising the upper edge portions of said side and end panels being of uniform width and bent to provide an outermost relatively narrow strip integrally connected along one edge by a substantially right angle bend to one edge of an intermediate strip and the opposite edge of said intermediate strip being connected integrally by a bend in excess of a right angle to one edge of a connection strip integrally connected to the upper edges of said side and end panels at the other edge thereof by a reverse bend to dispose said connecting strip in flatly overlying relationship with the exterior surface of the upper edge portions of said side and end panels, continuous weldment affixing means fixedly attaching the outermost edge of said outermost narrow strips of said reinforcing means to said exterior surface of each of said side and end panels, means enclosably connecting the corner ends of said reinforcing means, said corner enclosing connected means being comprised of respective unitary complementary configured sheet metal corner members having the lateral upper and lower connecting edge portions thereof configured in complementary shape to the exterior curvature of said relatively short radius 90° bend of said corners of said vessel and the longitudinal end connecting edge portions thereof configured in complementary shape to the respective terminal corner ends of said reinforcing means and respectively affixed to the exterior surfaces of said corners and the respective terminal ends of said reinforcing means by continuous weldments, thereby providing an enclosed rail-like reinforcing configuration having a substantially triangular shape in cross-section extending longitudinally along all side and end panels of said vessel in limited spaced relation to the upper edges thereof to provide readily inspected and repairable surfaces which are easy to clean.



3,937,357

PRESSURE-VACUUM RELIEF FUEL FILLER CAP

Ronald R. Burgess, Corunna, Mich., assignor to Tom McGuane Industries, Inc., Farmington, Mich.

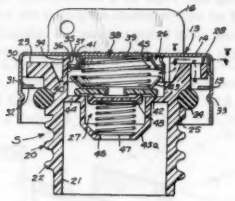
Filed Sept. 20, 1973, Ser. No. 399,120

Int. Cl.[2] B65D *51/16, 41/18*

U.S. Cl. 220—203 43 Claims

1. A pressure-vacuum relief fuel filler cap comprising

a cover,
said cover comprising a base and a peripheral flange,
a body of synthetic plastic material mounted at least partially within said cover with said peripheral flange surrounding a portion of said body,
said body including an outer threaded end adapted to engage a threaded filler opening,
said body having the other end thereof opposite said threaded end thereof engaging the base of said cover,
a pressure relief valve and associated valve seat within said body,
a vacuum relief valve and associated valve seat within said body,
and torque limiting means between said body and said cover for limiting the torque applied to said cover during application to a filler opening,
said torque limiting means comprising a plurality of circumferentially spaced radially inwardly extending portions on the inner surface of said peripheral flange of said cover,



and a plurality of integral radially yieldable teeth on the periphery of said body adjacent said portions on said cover,
said teeth including a ramp surface and a notch surface such that when the cover is rotated in one direction in applying the cap to a filler opening and a predetermined torque is reached, the cover can be rotated relative to said body with said radially inwardly extending portions moving along said ramp surfaces to succeeding notches, and when the cap is rotated in the opposite direction, said radially inwardly extending portions on the cover are engaged with the notches so that there can be no relative movement between the cover and the body,
said body including radially extending circumferentially spaced integral projections extending outwardly into contact with the inner surface of the peripheral flange of the cover.

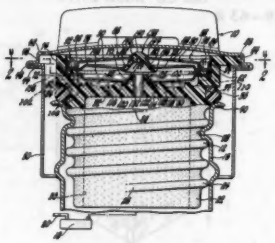
3,937,358

PRESSURE VACUUM RELIEF VALVE ASSEMBLY

Claude A. Smith, Sandusky, and Donald L. Williams, Port Clinton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 373,085, June 25, 1973, abandoned. This application Sept. 9, 1974, Ser. No. 504,138
Int. Cl.[2] B65D *51/16*
U.S. Cl. 220—203 **5 Claims**

1. A pressure-vacuum relief valve assembly for a semi-closed liquid vapor system having a container for liquid which evaporates to build-up pressure in the container to a positive value and which can be withdrawn from the container to reduce the pressure therein to a negative value comprising a housing having an outer flange thereon and a wall portion thereon formed transversely of said outer flange, said housing further including an internal flange located radially inwardly of the outer flange in spaced relationship therewith, a first apertured spring diaphragm having an outer periphery thereon supported by said internal flange, said first diaphragm and wall portion defining a vacuum relief chamber, passage means in said housing communicating said vacuum relief chamber with atmosphere, a second apertured spring diaphragm having a peripheral portion thereon supported in sealing relationship with the outer periphery of said first diaphragm and being spaced with respect to said first diaphragm to form a pressurizable control chamber therebetween, passage means for directly communicating the interior of said pressurizable control chamber with the interior of a container, a vacuum relief seal member on said wall portion interposed within said first apertured diaphragm to control flow from said vacuum relief chamber through the passage means between



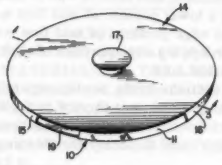
said pressurizable control chamber and said container for vacuum relief at a predetermined negative pressure range, a pressure relief seal member interposed within said second apertured diaphragm between said control chamber and atmosphere, said second diaphragm operative in response to a predetermined build-up of pressure within said control chamber to open communication between the interior of said housing and atmosphere thereby to relieve a predetermined positive pressure range within the control chamber.

3,937,359

VARIABLE VENT COVER FOR COOKING VESSELS

Archibald Dicks Stockton, Jr., 3868 S. Lake Drive, Roanoke, Va. 24018

Continuation-in-part of Ser. No. 334,662, Feb. 21, 1973, abandoned. This application May 6, 1975, Ser. No. 574,978
Int. Cl.[2] A47J *27/34*
U.S. Cl. 220—369 **5 Claims**

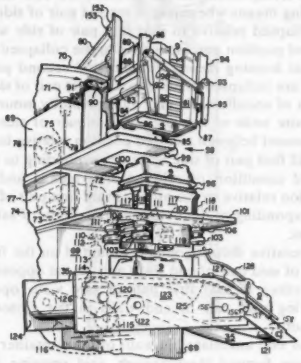


1. For use with a cooking vessel, a variable vent cover for said vessel comprising:
a. a first cover member having an opening therethrough,
b. at least two upstanding flanges spaced circumferentially about said cover and upstanding therefrom,
c. a second cover member,
d. at least two depending flanges spaced circumferentially about said second cover member,
e. said upstanding flanges of said first cover engageable with said depending flanges of said second cover member and being circumferentially rotatable relative thereto to define a variable area vent between said upstanding and depending flanges to regulate and vent to atmosphere from within a cooking vessel through the opening in said first cover member.

3,937,360
TURRET DEVICE FOR SUPPLYING ARTICLES FROM PLURAL MAGAZINES

Eugene F. Doucette, Burlington, Mass., assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 416,733, Nov. 19, 1973, Pat. No. 3,867,807. This application Aug. 28, 1974, Ser. No. 501,144
Int. Cl.² B65H 7/14
U.S. Cl. 221—11 **2 Claims**



1. A feed device for supplying bottle carriers or the like having a lower peripheral flange to an assembly machine comprising

a vertical frame member,

a horizontal turret means mounted on said vertical frame for rotary indexing movement in a closed path past a carrier feeding station,

indexing drive means connected to rotate the turret intermittently,

plural radial arms at equal increments about said turret,

a hollow carrier magazine mounted on each of said radial arms, comprising a vertical chute defining a vertical passage for a stack of nested carriers with their said flanges closely spaced vertically therein, said chute having a lower end opening for gravity flow of the carriers,

a shiftable gate means supported at the lower end of each said magazine chute for shifting movement between a closed position supporting the stack of carriers and preventing their vertical flow in said chute and an open position releasing said stack for vertical flow through the chute and out of the lower end opening comprising

a first pair of rocker arms,

a rock shaft pivotally connecting said first rocker arms on one side of the chute,

a second pair of rocker arms,

pivot means connecting said second rocker arms on an opposite side of the chute from said first rocker arms,

one end of each said first and second rocker arms extending below said lower end opening of the chute,

support bar means connected between the lower ends of each pair of rocker arms,

linkage means interconnected to said first rocker arms above the rock shaft and to said second rocker arms below the pivot means therefor for counter rocking movement respectively of said first and second rocker arms in unison, the support bars being normally positioned across said lower end opening of the chute for supporting a stack of carriers thereby,

a crank arm connected at one end to said rock shaft and connected at the other end to a cam follower,

a stationary cam supported on said frame for engaging each said cam follower of the magazines upon indexing movement of the magazine into the feeding station, said cam driving the rock shaft for moving the support bars of the gate means away from the lower opening of the chute permitting flow of the stack of carriers therethrough,

a hopper and feed assembly,

means connected to said frame for supporting said hopper assembly in stationary position at said feeding station in underlying registered relationship to a magazine indexed to said feeding station, said hopper assembly comprising

a vertical perimeter wall defining a rectilinear chute for receiving carriers from the magazine,

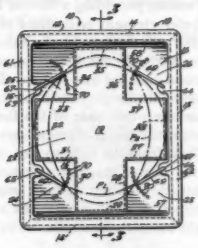
plural rotatable feed worms on said assembly and having helical means engageable with the flange of said carriers for controlling movement of the carriers through said chute, and

means connected to said feed worms for rotating them in unison in one direction, whereby the helical means engages the flange of each of the carriers in the stack and advances each of the carriers singly to separate them from the stack and thereafter release them below the chute at the feeding station.

3,937,361
ADJUSTABLE SELF-LEVELING PLATE DISPENSER

Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company, Miami, Fla.

Filed July 17, 1974, Ser. No. 489,384
Int. Cl.² A47F 1/06
U.S. Cl. 221—242 **8 Claims**



1. In a self-leveling plate dispenser of the type having a vertically-extending, open-top tank for receiving stacked plates, dishes or platters to be dispensed and including mechanism resiliently constraining the stacked plates, dishes or platters therein in the upward direction from underneath for dispensing from the top of the tank, the improvement comprising, mechanism within the tank adapting it for vertically guiding any one, selectively, of an incrementally increasing range of peripheral sizes of such stacked plates, dishes or platters, said vertically guiding mechanism comprising a vertically disposed guide rod member within each of four corner zones of the tank and means for independently stepwisely adjusting each of said guide rod members incrementally along a range of distances extending outwardly of the central longitudinal axis of the tank, said guide rod members serving as abutment slide means for guiding peripheral edge portions of any selected one of a wide range of incrementally increasing sizes and peripheral shapes of stacked plates, dishes or platters placed in the tank for dispensing.

3,937,362

LIQUID DOSAGE DEVICE HAVING ROTARY FEELER

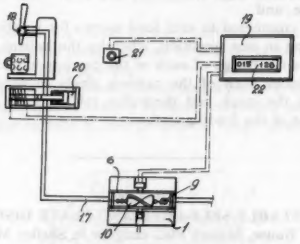
Erich Salmijak, Solna, and Eric Göransson, Stockholm, both of Sweden, assignors to Aktiebolaget Demektor, Hagersten, Sweden

Filed Sept. 13, 1973, Ser. No. 396,740

Claims priority, application Sweden, Sept. 15, 1972, 9294/72

Int. Cl.[2] B67D 5/30

U.S. Cl. 222—20 7 Claims



1. A device for the dosage of liquids and more particularly for the measurement of beer, comprising a casing having first and second through channels therein, said channels being arranged at right-angles to and crossing each other, said first channel being of uniform cross-section throughout the length thereof, a fixing means adjacent each end of the first channel, an axle extending centrally of the first channel and secured to the fixing means, means providing a flow of liquid through the first channel, a feeler element positioned in the first channel and arranged on the axle for free rotary movement and driven by the liquid flow through the first channel, a light source located in the second channel on one side of the first channel, a light sensitive element of semi-conductor type located in the second channel on the other side of the first channel in line with the light source, the feeler element serving to alternately break a beam of light from the light source, and the axis of the light source and the axis of the feeler element being in correspondence, so that the number of light impluses emitted on rotation of the feeler element constitutes a measurement of the volume of light having passed the feeler element.

3,937,363

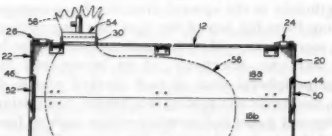
COLLAPSIBLE LIQUID CONTAINER FOR USE WITH PLASTIC LINERS

Alfred F. Anderson, 73 Grier Road, Vernon, Conn. 06066

Continuation-in-part of Ser. No. 412,905, Nov. 5, 1973, abandoned. This application Oct. 16, 1974, Ser. No. 515,257

Int. Cl.[2] B65D 35/56; B67D 3/00

U.S. Cl. 222—105 8 Claims



1. A collapsible container particularly adapted to be employed when in an uncollapsed condition for purposes of supporting therewithin a liner having contents located therein comprising:

a. housing means having an uncollapsed condition and a collapsed condition including a first pair of uncollapsible side walls and a second pair of collapsible side walls;

b. hinge means connecting each of said first pair of side walls and each of said second pair of side walls together for movement relative to each other between a first position corresponding to the uncollapsed condition of said housing means wherein said second pair of side walls are uncollapsed relative to said first pair of side walls and a second position corresponding to the collapsed condition of said housing means wherein said second pair of side walls are collapsed relative to said first pair of side walls;

c. a pair of uncollapsible end walls pivotally mounted at the opposite ends of one of said first pair of side walls for movement between a closed position relative to the other of said first pair of side walls corresponding to the uncollapsed condition of said housing means and an open position relative to the other of said first pair of side walls corresponding to the collapsed condition of said housing means;

d. cooperative securing means mounted on the free end of each of said pair of end walls and on the opposite ends of said other of said first pair of side walls operable for securing said pair of end walls in the closed position thereof;

e. one of said uncollapsible walls of the container having an opening formed therethrough, said opening being surrounded by an upstanding flange portion, said upstanding flange portion being internally threaded;

f. a liner having an opening provided therein through which the contents of said liner are capable of flowing, said liner being positioned within said housing means with said opening in said liner being aligned with said opening in said one of said uncollapsible walls; and

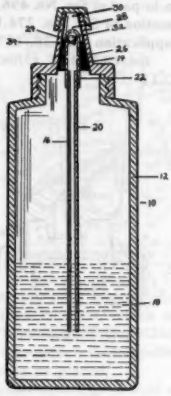
g. means mounted in said opening in said one of said uncollapsible walls operable to selectively control the flow of contents between the interior of said liner and the exterior of said housing means through said opening in said liner and said opening in said one of said uncollapsible walls by controlling the flow of the contents through said means, said means mounted in said opening in said one of said uncollapsible walls comprising a spigot including a tubular member having a through passage formed therein and a spigot portion having a handle formed integrally therewith, said spigot portion being mounted on said tubular member at one end thereof for rotation relative thereto between a dispensing position and a nondispensing position, said tubular member including a multiplicity of threads formed externally at the other end thereof threadedly engageable with said internal threads formed in said upstanding flange portion for mounting said spigot in said opening in said one of said uncollapsible walls, said through passage in said tubular member having an outwardly projecting circumferential rib formed therein inwardly of said other end of said through passage and a bushing formed of resilient material having one end thereof corresponding in diameter to the diameter of said through passage in said tubular member and the other end thereof having a diameter greater than the diameter of said through passage in said tubular member, said one end of said bushing being inserted into said through passage at said other end of said tubular member to capture said liner between said circumferential rib and said one end of said bushing so as to attach said liner to said spigot, said bushing having an opening formed therethrough to permit the contents of said liner to flow therethrough to said through passage in said spigot, said other end of said bushing being operable to close off said opening in said one of said uncollapsible walls when said spigot is removed from said opening in said one of said uncollapsible walls.

3,937,364

FOAM DISPENSING DEVICE

Hershel Earl Wright, 12 Eight Drive, Decatur, Ill. 62521

Filed Apr. 3, 1975, Ser. No. 564,701
Int. Cl.[2] B65D 37/00
U.S. Cl. 222—190 8 Claims



1. A foam dispensing device comprising, in combination,
a a flexible container for holding a foamable liquid and air having a discharge port at its upper end,
b a porous member separating the area adjacent said discharge port and the inside portion of said container,
c a conduit means extending longitudinally at least substantially through said porous member said conduit means including an opening communicating with the inside portion of said container, an opening communicating with the porous member and an air re-entry, and
d a directional valve system associated with the air re-entry for substantially precluding outward fluid flow through the air re-entry and directing fluid from inside the container through the conduit means into the porous member through said opening communicating with said porous member when the container is pressurized.

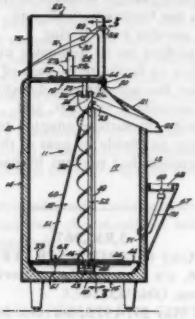
3,937,365

AUGER LIFT MECHANISM FOR AUTOMATIC ICE DISPENSERS

George R. Shelley; Robert J. Shelley, Jr., both of Miami; Arthur B. Dixon, Coral Gables, and Bruce F. House, North Miami Beach, all of Fla., assignors to Shelley Manufacturing Company, Miami, Fla.

Filed July 17, 1974, Ser. No. 489,385
Int. Cl.[2] G01F 11/00
U.S. Cl. 222—241 6 Claims

1. An ice dispenser comprising, in combination, an ice receiving cabinet, rotative auger means for lifting ice from the interior of said ice receiving cabinet for dispensing at a position near the upper end of said ice receiving cabinet, said auger means comprising an elongated auger and an ice elevating abutment slide member partially surrounding said auger, to define a side opening co-extensive with said auger, an auger disc concentrically affixed to the lower end of said auger for rotation in unison therewith, an electric drive motor, means releasably interconnecting said electric drive motor with said auger for rotating said auger and said auger disc in unison within said ice receiving cabinet, and means on the upper surface of said auger disc for urging ice in said ice receiving cabinet in the direction of said side opening of said ice elevating abutment slide member, the upper end of said ice elevating abutment slide member having a discharge opening for the dispensing of ice, said ice elevating abutment slide member being substantially co-extensive with said auger and being formed with a pair of relatively right-angularly-bent side wall portions of substantially equal width, an angularly-bent side wall portion defining an angle of approximately 45° with one of said side wall portions and being directed opposite and



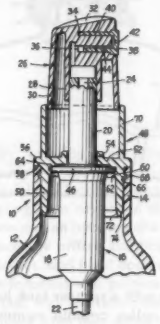
outwardly of the other of said side wall portions, the vertically-extending outer edge of said angularly-bent side wall portion merging into an outwardly-bent side wall portion extending substantially parallel with respect to said other of said side wall portions.

3,937,366

HAND-HELD PUMP TYPE DISPENSER

Wolf Steiman, Bridgeport, Conn., assignor to VCA Corporation, Greenwich, Conn.

Filed Apr. 5, 1974, Ser. No. 458,338
Int. Cl.[2] B67D 5/42
U.S. Cl. 222—321 1 Claim



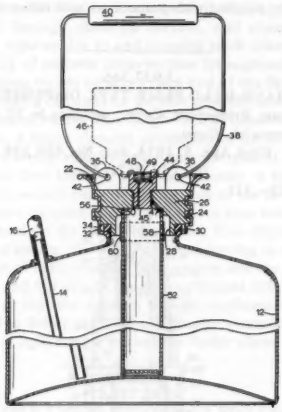
1. An atomizer pump dispenser, comprising in combination:
a. a container with a neck portion having a cylindrical inner wall that is provided with an annular groove adjacent the upper end of the neck portion;
b. a resilient adaptor having
i. a transverse wall portion having a central opening therein,
ii. a cylindrical skirt portion integral with and depending from the transverse wall portion, the skirt portion being received in the neck portion of the container and being provided with a first annular bead on its exterior wall that is received in the groove, and the inner wall of the skirt portion being provided with a second annular bead adjacent its upper end, the lower end of the skirt having an arcuate bevel on its outer surface and an angular bevel on its inner surface;

c. a dispensing pump assemblage including
  i. a stationary tubular member having an outwardly extending flange at its upper end, the flange being sealingly received between the second annular bead and the bottom of the transverse wall,
  ii. a reciprocable plunger member projecting through the opening in the transverse wall; and
d. said second annular bead having
  i. a conical surface on its underside constituting a camming surface to facilitate by-pass of the bead and the flange when the adapter and dispensing pump assemblage are assembled together, and
  ii. a sharp undercut surface adapted to receive the edge of the flange to enable by-pass of the flange and bead in one direction but prevent by-pass in the opposite direction.

3,937,367
GAS CHARGED SPRAYER

Charles B. Hood, c/o Chardon Laboratories, Inc. P.O. Box 1004, Columbus, Ohio 43216

Filed May 27, 1975, Ser. No. 580,765
Int. Cl.² B65D *83/06*
U.S. Cl. 222—399 **4 Claims**

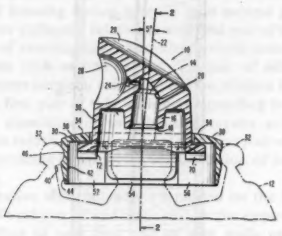


1. In combination with a sprayer tank having a top wall and a valve-controlled outlet conduit communicating with the interior of the tank adjacent the bottom thereof; a gas pressurization adapter for said tank comprising:
  a. a connector fitting carried in the top wall of said tank and arranged to sealingly receive and support an inverted, liquid propellant supply cartridge above the top wall of said tank, said fitting having a propellant-conducting passage extending therethrough; and
  b. an elongated, propellant-receiving trap having an upper end communicating with the propellant-conducting passage of said fitting and a closed lower end portion extending downwardly into said tank for direct heat exchange contact with a spray liquid contained in said tank, said trap defining an elongated vaporization chamber into which a pressurized liquid propellant may be introduced by way of said fitting, and said trap being provided toward the upper end thereof with an outlet opening through which vaporized propellant may flow into the upper region of said tank.

3,937,368
AEROSOL ACTUATOR NOZZLE

Harold G. Hoagland, Croton-on-Hudson, N.Y., assignor to Elmer Hoagland, North Bergen, N.J. and Curtis Ailes, Mt. Kisco, N.Y., part interest to each

Continuation-in-part of Ser. No. 459,697, March 10, 1974, and a continuation-in-part of Ser. No. 496,409, Aug. 12, 1974, which is a continuation of Ser. No. 274,195, July 24, 1972, abandoned. This application Feb. 28, 1975, Ser. No. 554,102
Int. Cl.² F16K *35/04*
U.S. Cl. 222—402.11 **14 Claims**



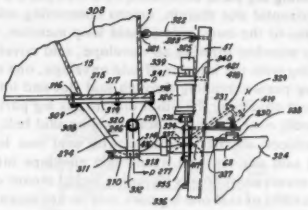
1. An actuator nozzle assembly for an aerosol container of the type having a tubular valve stem protruding at the center of one axial end thereof, comprising
  an actuator which is rotatable with respect to the valve stem when assembled therewith,
  said actuator comprising a member defining a cylinder surface operable to telescopically interfit with the valve stem to have a sliding fit therewith,
  said actuator including a skirt portion having a radially outwardly extending flange,
  the upper surface of said flange generally defining a plane,
  a locking ring arranged for assembly to the upper edge portion of the aerosol container,
  said locking ring having a radially inwardly extending flange portion which interlocks with the upper surface of said radially outwardly extending flange of said skirt portion of said actuator to maintain said actuator in assembled relationship with the valve stem of the aerosol container,
  said locking ring including at least two integral locking abutments extending radially inwardly from the inside walls thereof beneath said skirt portion and arranged to abut lower surfaces of said skirt portion to thereby lock said actuator against downward movement to prevent actuation of the associated aerosol container valve,
  said lower surfaces of said skirt portion engaged by said locking abutments having reduced radius portions corresponding to each of said locking abutments,
  said actuator being rotatable to position said reduced radius portions opposite to said abutments to thereby disengage said skirt portion from said locking abutments to unlock said actuator,
  said skirt portion of said actuator including a plurality of cantilever spring members extending downwardly therefrom and arranged to exert spring forces radially outwardly against the inner surface of said locking ring;
  said inner surface of said locking ring including discontinuities operable in cooperation with said cantilever spring members to provide a detent spring force for rotational indexing operation of said actuator between at least one locked rotational position in which said skirt portion is locked with said locking abutments and at least one unlocked rotational position in which said skirt portion is disengaged from said locking abutments,
  said lower surfaces of said skirt portion engaged by said locking abutments comprising the lower ends of said cantilever spring members.

3,937,369

HOUSING FOR AN IMPELLER

Harold Seals, Aiken, S.C., assignor to Larry Harold Kline, Charleston, S.C.

Filed July 11, 1974, Ser. No. 487,818
Int. Cl.² G01F 11/20
U.S. Cl. 222—410 15 Claims



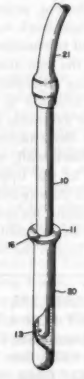
1. A housing, mounted on a bagging machine comprising many members, for an impeller, which is mounted on an impeller shaft and is capable of moving material, comprising:
   a. an enclosure within which said impeller, mounted on an impeller shaft, may be placed;
   b. a plurality of shaft openings in said enclosure through which said impeller shaft may extend;
   c. material entrance means located in the top of said enclosure through which said material may be placed in said enclosure;
   d. material exit means located in the front and bottom of said enclosure through which said material may leave said enclosure;
   e. access means located in the back of said enclosure allowing access for maintenance purposes to said impeller and said impeller shaft within said enclosure without removal of said material exit means or said many members of said bagging machine.

3,937,370

CONTROLLED DEPTH ASPIRATION CANNULA

Michael E. Witty, El Toro, Calif., assignor to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Aug. 14, 1974, Ser. No. 497,421
Int. Cl.² B67D 5/60
U.S. Cl. 222—464 3 Claims



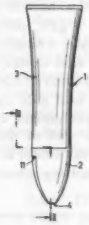
1. An aspiration cannula for aspirating fluids from an open mouthed elongated receptacle comprising:
   a. an elongated tubular member terminating at one end portion with a wall;
   b. said tubular member being constructed of a first part and a second part;
   c. said first part including a radially extending flange for controlled depth aspiration of said receptacle and a centrally positioned socket axially disposed therein;
   d. said second part having said end wall portion and being adapted and constructed to have a portion thereof located in said socket remote from said end wall portion;
   e. said tubular member having a plurality of orifices circumferentially positioned substantially at the end portion of the tubular member having said end wall;
   f. said first part terminating at the end remote from said radially extending flange with attachment means adapted and constructed to provide a sealing fitment for a flexible conduit;
   g. means for preventing said radially extending flange from completely covering the mouth of said open mouthed elongated receptacle.

3,937,371

AUTOMATICALLY OPENING AND CLOSING CLOSURE DEVICE

Franco Del Bon, 9, Henzmannstrasse, 4800 Zofingen, Switzerland

Continuation-in-part of Ser. No. 371,386, June 19, 1973, abandoned. This application Jan. 10, 1974, Ser. No. 432,241
Claims priority, application Switzerland, Mar. 2, 1973, 2907/73; France, May 11, 1973, 73.17182
Int. Cl.² B65D 25/40
U.S. Cl. 222—494 7 Claims



1. Automatically opening and closing closure device adapted for use with a container having a liquid, pasty or foamy filling, comprising a head body having a discharge duct extending therethrough, an orifice in the outside of the discharge duct, a recess and an opening at a side of the head body away from said discharge orifice and being destined for being joined to said container, said head body comprising a continuous integral circumferential wall portion about said discharge duct and orifice, said wall portion comprising an elastically flexible zone extending from part of the circumference of said orifice toward said opening, said flexible wall zone forming at least a part of the bottom of said recess, the remainder of said wall portion about said discharge duct and orifice being substantially rigid, where the wall of the discharge duct and the head body are formed as one piece; a spring member provided at the base of said flexible wall zone; and beak means mounted in the recess of said head body and comprising a two-armed lever, one arm of which engages the spring member and the other arm of which is formed as an elastically deflectable spring-loaded arm associated with said head body so that the free end of said arm is located on the side of said wall portion containing said flexible wall zone, said spring-loaded arm being biassed into engagement with said flexible wall zone near said orifice to hold the latter in sealing engagement with said rigid wall portion part and closing said orifice, the bias of said deflectable arm being so dimensioned as to yield to a determined excess pressure inside said discharge duct to cause

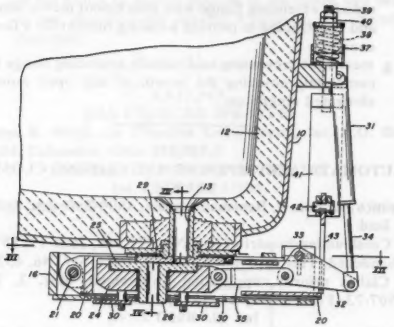
said elastic zone of said wall portion to urge the free arm end away from said rigid part thereof and thereby to open said orifice, while said excess pressure prevails in said duct.

3,937,372

SLIDING GATE MECHANISM WITH SIDE WALL MOUNTED BIASING SPRINGS

Charles H. Bode, Jr., Bethel Park Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1974, Ser. No. 518,658
Int. Cl.[2] B22D *37/00, 41/08*
U.S. Cl. 222—504 **8 Claims**



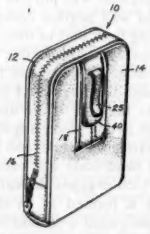
1. The combination of a bottom-pour vessel having an outlet in its bottom wall, a gate, means on the bottom wall slidably supporting said gate, whereby said gate may control flow of material through said outlet, and motive means for moving said gate back and forth to open and close said outlet, with a mechanism urging said gate upwardly with respect to said bottom wall, said mechanism comprising at least one spring, means on the side wall of the vessel supporting said spring on the side wall of the vessel at a location remote from said gate, and force-transmitting means connecting said spring with said gate.

3,937,373

ARTICLE CARRIER WITH IMPROVED COMBINATION BELT LOOP AND CLIP

Kenneth W. Artz, Albuquerque, N. Mex., assignor to Koszegi Leather & Vinyl Products, Inc., South Bend, Ind.

Filed Dec. 11, 1974, Ser. No. 531,486
Int. Cl.[2] A45C *11/00*
U.S. Cl. 224—26 R **1 Claim**



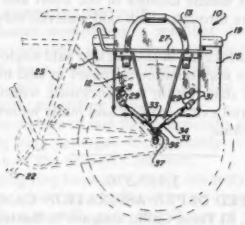
1. In an article carrier which includes a back having front and rear faces, the improvement comprising a loop member having upper and lower ends, said loop member having inner and outer sides, means attaching said upper and lower loop member ends to said carrier back with said loop member inner side spacedly confronting said back face to define a belt receiving passage between the back and loop member, clip means connected to said loop member at its outer side and including a downturned flexible part for engaging a belt, pocket or similar object to support said article carrier when no belt extends through said loop member defining passage, said clip means includes an inverted U-shaped holder having a pair of depending leg parts connected by a web part, a cover having a horizontal slot therein, means connecting said cover at its margins to the outer side of said loop member, said cover and loop member forming an envelope, said cover slot communicating with the interior of said envelope, one of said clip means leg parts extending through said slot and into the interior of said envelope, the other clip means leg part extending downwardly over said cover for engaging said belt, pocket or similar object, means associated with said one leg part for securing said one leg part within said envelope interior, said leg part securement means including jacket means covering at least a portion of said one leg part, said jacket means including oppositely extending tabs having an over-all transverse dimension exceeding the length of said cover slot, said tabs being located within said envelope interior.

3,937,374

PANNIER BAG CONSTRUCTION AND METHOD OF ATTACHMENT

Edward K. Hine, Jr., Boulder, Colo., assignor to Hine-Snowbridge, Inc., Boulder, Colo.

Filed Oct. 21, 1974, Ser. No. 516,547
Int. Cl.[2] B62J *9/00*
U.S. Cl. 224—32 A **13 Claims**



1. A pannier bag, comprising: a bag structure having a rigid back wall; at least one downwardly-oriented upper hook member secured to the rear portion of the bag at the rigid back wall; a plurality of attachment points secured to the rear portion of the bag at the rigid back wall; at least one resilient member having at each end releasable securing means engaging one attachment point, the two attachment points engaged by the securing means being adjacent opposed sidewalls; and lower attachment means adapted to be secured to a lower portion of a bicycle carrier assembly and carried by the resilient member intermediate the attachment points of the resilient member to the rigid back wall, whereby the upper hook member may be secured to the upper portion of a bicycle carrier assembly and, upon downward distension of the resilient member, the attachment means secured to the lower portion of the bicycle carrier assembly to provide a stabilized attachment of the pannier bag to the bicycle carrier assembly.

3,937,375

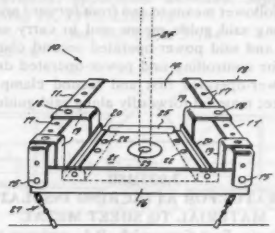
BUMPER SUPPORT FOR A BOAT LOADER

Everette E. Daniels, 221 Locust St., Des Moines, Iowa 50309

Filed Oct. 29, 1974, Ser. No. 518,454
Int. Cl.[2] B60R *9/00*
U.S. Cl. 224—42.07 **3 Claims**

1. In a bumper support for a boat loader, the combination of a pair of spaced apart bumper traps, one end of each of said bumper straps having an acute hook formed therein for hook-

ing over an upper edge of a car rear bumper, a rear opposite end of said strap being downwardly bent and riveted to a transversely extending rear end bar, means by means of a tension unit to rigidly secure said bumper support to a lower edge of said car bumper, and means for said bumper support to retain a boat loader loading rod, said means for securement of said unit to a lower edge of said car bumper comprising a



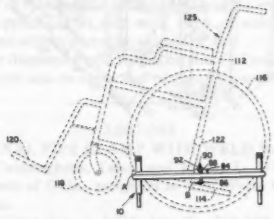
paid of tension units each one of which at one end is secured to an angle bracket mounted at an end of said rear bar, said bracket being connected to an eye bolt attached to a turnbuckle which at its opposite end be means of an eye bolt is connected to a short length of chain attached at its opposite end to a bracket that hooks under said automobile bumper rear lower edge.

3,937,376

VEHICLE SUPPORT FOR WHEELED VEHICLES

Marlin B. Ewing, 259 S. Bayshore Drive, Valparaiso, Fla. 32580

Filed Sept. 16, 1974, Ser. No. 506,022
Int. Cl.² B60M *9/00*
U.S. Cl. 224—42.08 **11 Claims**



1. In a wheelchair support for attachment to an automobile bumper or other surface for supporting a folded wheelchair of the type including large rear wheels and a bottom frame having a backward projecting portion:

a. a wheelchair carrying frame comprising opposed side frame members defining a space receiving therein the large, vertically disposed wheels of said folded wheelchair with the periphery of the wheels partly below said carrying frame resting in the space defined by and on the opposed side frame members and with the projecting portion of the wheelchair bottom frame within the confines of said carrying frame,

b. means on said carrying frame for attaching and supporting said carrying frame on the bumper or the surface in horizontally extended carrying position,

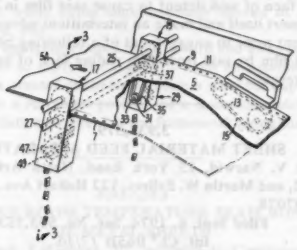
c. a retainer support member on said carrying frame and a retainer member on said retainer support member, said retainer member being engaged from beneath by the wheelchair bottom frame when said wheels are in said space and the projecting portion of the wheelchair frame is projected and rotated within said space thereby preventing the movement of the lower frame in vertical or rotational direction about the engagement of the rear wheels with the side members which define the space, whereby a person without the use of his legs may insert the wheelchair in place on the carrying frame and lock the wheelchair wheel to prevent relative rotation between wheelchair frame and wheel.

3,937,377

CHOPPER FOR MARGINS OF MULTI-FOLDED PAPER

Marlin A. Schueler, San Leandro, Calif., assignor to American/Durein Company, Oakland, Calif.

Filed Oct. 11, 1974, Ser. No. 514,007
Int. Cl.² B26D *1/56*; B26F *3/02*
U.S. Cl. 225—94 **5 Claims**



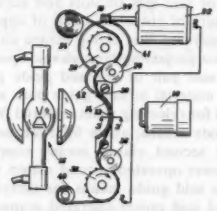
1. A chopper for chopping tape and the like into small pieces, comprising: a stationary chopping blade having a series of angular teeth in line thereon defining grooves therebetween; a shaft supported for rotation parallel to the line of teeth; a series of pivoted support members supporting said shaft; a plurality of knives mounted on said shaft, each of said knives having at least one tooth element fitting into a groove of the chopper blade; means supporting said knives on said shaft in staggered relationship whereby one knife enters a groove at a time; and means connected for rotating said shaft.

3,937,378

FILM FEED DEVICE

Jaroslav J. Kopernicky, Mississauga, Canada, assignor to Cinex Communications Inc., Toronto, Canada

Continuation-in-part of Ser. No. 358,882, May 10, 1973, abandoned. This application June 27, 1974, Ser. No. 483,771
Int. Cl.² G03B *1/28*
U.S. Cl. 226—55 **4 Claims**



1. In a movie film apparatus, a device for intermittently feeding flexible perforated film past an optical system a unit length at a time comprising,

a film support for guiding a strip of perforated film for exposure to an optical system,

a rigid detent on said film support,

film feed means in advance of said detent for continuously feeding film towards said detent,

said front film sliding face of said detent being engageable by perforations of film as the film moves in the direction of film feed to temporarily stop forward motion of the film in advance of the detent and form it into a loop behind the detent which increases in size with continuing film feed and decreases the angle of attack of said film at said front film sliding face of said detent,

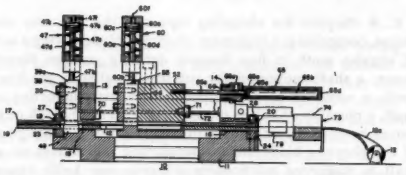
said device having a free space in advance of and extending to said detent for film to form in a loop to a predetermined size after initial engagement with said front film sliding face of said detent,

stop means at the edge of said free space with a reaction surface engageable by a loop as it achieves its maximum predetermined size in said free space to exert a reaction force on film with continuing film feed that has a substantial component in the direction of slope of said film sliding face of said detent to cause said film in said loop to reassert itself and make an intermittent advance past said detent prior to engagement of a following perforation of said film by said front film sliding face of said detent as aforesaid.

3,937,379
SHEET MATERIAL FEED APPARATUS

Bernard V. Narwid, 15 York Road, North Arlington, N.J. 07032, and Martin W. Fellers, 122 Hobart Ave., Short Hills, N.J. 07078

Filed Sept. 6, 1974, Ser. No. 503,753
Int. Cl.[2] B65H 17/36
U.S. Cl. 226—150 11 Claims

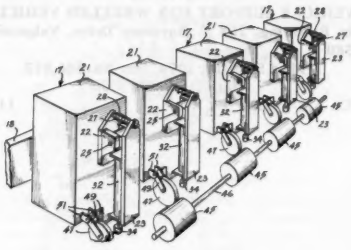


1. Apparatus for step-feeding sheet material, said apparatus including: guideway and first anvil means comprising a pair of opposed guide plate means for constraining sheet material against buckling of the latter when sheet material is disposed in a guide path between said pair of opposed guide plate means and is fed along said guide path, said pair of guide plate means each having a set of slots therein and said slots in said sets longitudinally leading along said guide in and being spaced apart from one another in said set laterally of said guide path, and first anvil means disposed along said guide path forwardly of said sets of slots and accessibly opposite apertured structure of one of said pair of opposed guide wall means; power-operated first clamp means comprising driven first presser means projecting through said apertured structure of said one of said pair of opposed guide plate means for clamping sheet material in said guide path against said first anvil means and for releasing sheet material from said presser anvil means; guide means; guide follower, second anvil and power-operated second clamp means comprising, second anvil means, power-operated second clamp means, and follower means on said guide means for carrying said second anvil means and said power-operated second clamp means forwardly toward said first anvil means and said first presser means, and rearwardly, said second anvil means having a set of projections extending through said set of slots in a first of said pair of opposed plate means slightly into said guide path, and said power-operated second clamp means including driven second presser means, said second presser means having a set of projections aligned with said set of slots in the other of said pair of opposed guide plate means for clamping sheet material in said guide path against said set of projections of said second anvil means and for releasing sheet material from said second anvil means, and said follower means carrying said second anvil means and said power-operated second clamp means for sheet material clamped against said second anvil means by said second presser means to be forwardly fed having said set of projections of said second anvil means and said set of projections of said second presser means follow said sets of slots in said pair of opposed guide plate means; power-operated drive means connected with said guide follower, second anvil and power-operated second clamp means for moving said follower means to and from forward and rearward positions along said guide means and to carry said second anvil means and said power-operated second clamp means; and means for controlling said power-operated drive means and said power-operated first and second clamp means to step-feed sheet material forwardly along said guide path.

3,937,380
APPARATUS FOR ATTACHING INSULATING MATERIAL TO SHEET METAL

J. Andrew Craig, East Greenwich, R.I., assignor to Gripnail Corporation, East Providence, R.I.

Filed Jan. 15, 1975, Ser. No. 541,361
Int. Cl.[2] B27F 7/02
U.S. Cl. 227—100 7 Claims



1. Apparatus for mounting insulating material onto sheet metal by means of clinch-type fasteners comprising a frame, at least one fastener applying machine mounted on said frame, said fastener applying machine including a housing, a support member swingably mounted on said housing, fluid cylinder means mounted on said support member and having a downwardly extending piston rod, a magnetic driving head fixed to the lower end of said piston rod, fastener chute means having a portion located adjacent to said driving head, means for transferring a fastener from said chute means to said driving head, a rotatable anvil mounted below said driving head, a hold-down roller located adjacent to said driving head and above said anvil, and means for driving said rotatable anvil, whereby a strip of sheet metal and an overlying strip of insulating material located between said anvil and said roller are driven in a direction normal to said fluid cylinder so that when said cylinder is energized a fastener carried by said magnetic head is caused to penetrate the insulating material and grippingly engage the sheet metal and penetration of said insulating material by said fastener causes said fluid cylinder to swing so that no relative motion between the fastener and the material occurs during the driving process.

3,937,381

APPARATUS FOR TREATING THE CORNERS OF PLANAR POLYGONAL WORKPIECES

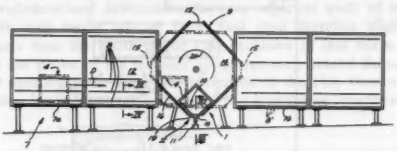
Joseph Lang, Wurttemberg, Opf.; Helmut Meckenstock, Waltrop, and Hans-Joachim Nopper, Oberkoplitz, all of Germany, assignors to Flachglas Aktiengesellschaft Delog-Detag, Gelsenkirchen, Germany

Filed Oct. 1, 1973, Ser. No. 402,577

Claims priority, application Germany, Sept. 29, 1972, 2247806; May 19, 1973, 2325570

Int. Cl.² B23K *37/04*

U.S. Cl. 228—6 **2 Claims**



1. An apparatus for treating the corners of a planar workpiece of polygonal outline, said apparatus comprising:

a generally horizontal conveyor including support means for holding said workpiece in an upright condition standing on one edge during displacement by said conveyor;

treatment means at a location below said conveyor for treating a corner of said workpiece;

manipulator means at said conveyor adjacent said location and engageable with said workpiece for positioning a corner of said workpiece at said location for cooperation with said treatment means, said conveyor having an upstream transport stretch terminating adjacent said location and a downstream transport stretch in line with said upstream stretch and starting adjacent said location, said manipulator means including a support above said treatment means having four sides, a pivot defining a horizontal axis of rotation for said support and means for rotating said support about said axis, each of said sides being provided with a plurality of rollers; and

means for displacing said rollers on three of said sides parallel to said axis to clear and engage said workpiece.

3,937,382

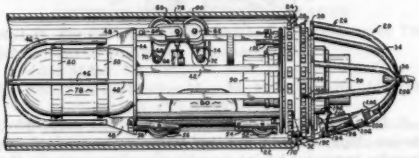
INTERNAL PIPE CLAMP WITH WELD BACKUP

Joseph A. Cunningham, Tulsa, and Jimmy L. White, Broken Arrow, both of Okla., assignors to H. C. Price Co., Bartlesville, Okla.

Filed Jan. 2, 1975, Ser. No. 538,089

Int. Cl.² B23K *37/04*

U.S. Cl. 228—49 **27 Claims**



1. An internal pipe clamp comprising: a frame;

means mounted on the frame for supporting the latter for movement through the pipe;

a first housing section mounted on said frame and supporting a plurality of first clamping members adapted to be moved into clamping engagement with a first pipe joint;

a second housing section mounted on said frame and supporting a plurality of second clamping members in closely spaced relationship to said first clamping members and adapted to be moved into clamping engagement with a second pipe joint;

said first and second housing sections being axially aligned and movable relative to each other along said axis;

means for moving said first housing section relative to said second housing section;

means for moving said first and second clamping members into engagement with said first and second pipe joints;

weld backup means coupled with one of said housing sections intermediate said first and second clamping members and comprising first and second backup segments, each of said segments extending through an arc and terminating in a circumferentially extending wedge-shaped end complemental to the wedge-shaped end of an adjacent segment and adapted to be slidingly moved in a partially circumferential direction relative to an adjacent segment while being simultaneously moved in a radial direction; and

means for applying a radial force toward and away from said segments to move the segments from an extended position of a greater diameter wherein a weld backup is presented to a retracted position of a lesser diameter to accommodate movement of the framework along the pipe.

3,937,383

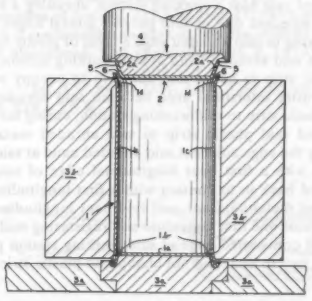
HIGH SPEED ROOM TEMPERATURE SEAM BONDING OF METAL SHEETS

Walter Sawert, LaGrange, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,567

Int. Cl.² B23K *21/00*

U.S. Cl. 228—115 **16 Claims**



1. In a method of cold pressure welding a pair of cold pressure weldable metal members arranged with edges of superposed end portions of said members substantially in register with one another, comprising the steps of placing a metallic interlay between the faying surfaces to be bonded to form a weld assembly and compressing said weld assembly, thereby creating an intense interfacial flow conducive to bonding of said member in a solid phase welding bond, and wherein said interlay is of cross-section such as to deform at substantially different rates, as measured along mutually perpendicular axes, consequent to said compression of said assembly.

3,937,384

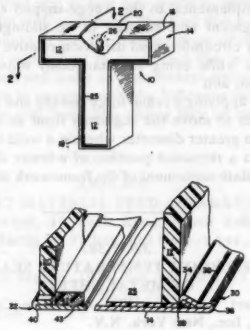
PROCESS FOR CONSTRUCTING THREE-DIMENSIONAL SIGN CHARACTER

Robert W. Minogue, Cupertino, and Lloyd E. Troyer, San Carlos, both of Calif., assignors to Let-R-Edge of Canada, Ltd., Laberta, Canada

Continuation-in-part of Ser. No. 356,983, May 3, 1973, abandoned. This application July 13, 1973, Ser. No. 379,012

Int. Cl.² G09F 7/12

U.S. Cl. 228—120 **6 Claims**



1. A process for producing a surrounding sheet strip for the construction of a three-dimensional sign character having a plastic face, said process comprising the steps of: providing a continuous strip of metal sheet having first and second parallel lateral edges; continuously feeding said strip of metal sheet at a preselected rate past a working station; abrading a band on said metal adjacent one of said parallel lateral edges of said sheet; applying to said abraded edge a layer of plastic-to-metal adhesive on said abraded band at said working station, applying a plastic strip to cause said adhesive to occupy substantially the entire interstitial area between said abraded band and said plastic strip to said working station; curing said adhesive to bond said plastic strip to said abraded metal; and, convoluting the edge adjacent said abraded band at said working station with a first bent longitudinal edge of said sheet metal folded back in to contact with a first longitudinal area of said sheet metal adjacent said first bent longitudinal edge to form at least one first convolute and registering said plastic strip to said convoluted edge at said working station prior to said curing step to abut and not clamp said plastic strip at said convolute.

3,937,385

METHOD OF MANUFACTURING COMPOUND BILLETS FOR HYDROSTATIC EXTRUSION

Tsunesaburo Asada, Minoh; Takefumi Horiuchi; Kiyoshi Matsumoto, both of, Kobe; Yoshiyuki Monju, Nishinomiya; Yoshihiro Yamaguchi, Ashiya; Masataka Noguti, Nishinomiya; Masao Nishihara, Kyoto; Tatsu Fujita, Kobe, and Tomiharu Matsushita, Nishinomiya, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 316,923, Dec. 20, 1972, abandoned. This application Feb. 28, 1975, Ser. No. 553,991

Int. Cl.² B23K 37/00

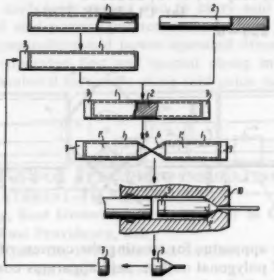
U.S. Cl. 228—131 **11 Claims**

1. A method of producing compound billets wherein a substantially cylindrical internal member of one metallic material is sealed within a substantially tubular external member of a different metallic material, comprising the steps of:

cleaning those surfaces of said internal member and said external member which are to be brought into contact with each other;

positioning said internal member within said external member, whereby the external and internal peripheral surfaces, respectively, thereof are brought into contact with each other so as to provide a compound billet blank;

sealing the interior of the external member while the interior is under vacuum conditions; and



performing a plastic forming process upon the external portion of said compound billet blank, while the interior space of said external member is maintained in said vacuum condition, so as to obtain a compound billet product which is provided with a conical shaped nose portion wherein said internal and external members are bonded together at the contacting surfaces due to said plastic forming, the cross-sectional configuration of said formed and bonded nose portion therefore presenting approximately the same surface areas for both of said external and internal members.

3,937,386

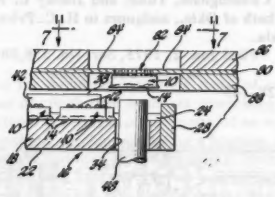
FLIP CHIP CARTRIDGE LOADER

Ronald J. Hartleroad, Twelve Mile, and James P. Grabowski, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 9, 1973, Ser. No. 414,222

Int. Cl.² H05K 3/30

U.S. Cl. 228—180 **3 Claims**



1. In a system for bonding integrally leaded semiconductor device chips to conductive lead frame structures including a transfer apparatus having a probe extending vertically therefrom, an apparatus for successively positioning onto said probe semiconductor device chips having opposite parallel smooth edges and protruding burrs on said opposite edges contiguous one face, said apparatus comprising a base member having an elongated groove in one surface thereof, said groove having a width slightly greater than the width of said semiconductor device chips inclusive of burrs, said groove having a constant depth along its length, said depth being less than the thickness of said chips and greater than the height of said burrs on said chip edges, a stop member extending trans-

versely across one end of said groove, an opening located about a center line spaced approximately one-half the width of said chip inclusive of said burrs from said stop member, said opening extending from the groove bottom to an opposite surface of said base member, two spaced juxtapositioned guide rails on said one surface of said base member, said guide rails partially overlying said groove and extending substantially the length thereof, said guide rails spaced apart at a distance slightly greater than the width of burred semiconductor device chip noninclusive of said burrs and less than the width of said chip inclusive of said burrs for contact with only relatively smooth opposite scribed edges of said chip, wherein said chip is free to traverse said groove but closely maintains a predetermined orientation therein, adjacent ends of said guide rails being spaced from said stop member slightly greater than the width of the chip inclusive of said burrs, so that the probe of the transfer apparatus may extend through said opening and engage the back side of the chip thereover to align it with an overlying conductive lead frame structure.

3,937,387

METHOD OF FLUXLESS BRAZING AND DIFFUSION BONDING OF ALUMINUM CONTAINING COMPONENTS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Aleck B. Featherston, Fort Worth, and Kent P. O'Kelly, Arlington, both of Tex.

Filed Mar. 12, 1974, Ser. No. 450,500
Int. Cl.² B23K *1/20*
U.S. Cl. 228—193 **18 Claims**

1. A method for fluxless brazing of aluminum-containing parts wherein said method utilizes an aluminum alloy brazing material, comprising the steps of:

a. removing the aluminum oxide coating from the surfaces of said brazing alloy and said parts to be brazed;

b. coating said surfaces with a sealer containing a polymeric material, said polymeric material having the property of preventing significant permeation of oxygen to said surfaces and being thermally removable from said surfaces leaving essentially no residue;

c. disposing said brazing alloy between the surfaces of said parts to be brazed;

d. bringing said surfaces of said parts to be brazed into intimate contact with said brazing alloy;

e. subjecting said surfaces, in a substantially oxygen free environment, to a temperature sufficient to thermally remove all of said polymeric material from said surfaces;

f. heating said surfaces and said brazing alloy, in said substantially oxygen free environment, to a temperature sufficient to cause fusion of said brazing alloy and adherence of said surfaces; and

g. cooling said thus brazed parts.

3,937,388

METHOD FOR SEALING PACKAGES

Daniel D. Zimmerman, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Division of Ser. No. 180,774, Sept. 15, 1971, Pat. No. 3,756,490. This application May 24, 1973, Ser. No. 363,658
Int. Cl.² B23K *31/00*
U.S. Cl. 228—222 **3 Claims**

1. A method of sealing a pair of elements to each other to form a package, comprising the steps of:

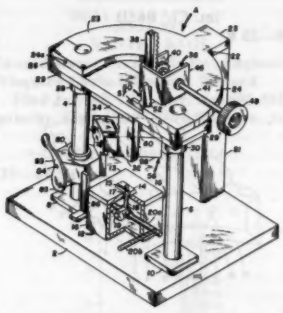
applying a meltable sealant to a portion of one of said elements;

positioning one of said elements on a first heat sink;

positioning the remaining element on the element positioned on the first heat sink;

applying a heat source to the elements for causing said sealant to melt and flow between portions of the elements for connecting said elements in sealed relation;

applying a second heat sink to the element not in contact with said first heat sink, thereby to remove heat from said elements during application to said elements of heat from the heat source and to cause a compressive force to be exerted on the elements to hold said elements together;



displacing the heat source from proximity to the elements, thereby to discontinue the application of heat to the elements; and,

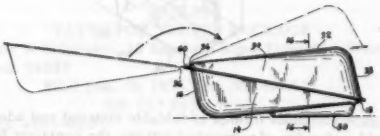
continuously removing heat from the elements by means of the first and second heat sinks both during and after discontinuation of the application of heat to the elements.

3,937,389

DISPOSABLE FOOD CONTAINER

Harold Wind, c/o F-J Packaging Development Corporation, 80-103 Surrey Place, Jamaica, N.Y. 11432

Continuation of Ser. No. 212,528, Dec. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 880,871, Nov. 28, 1969, abandoned. This application Oct. 9, 1973, Ser. No. 404,513
Int. Cl.² B65D *1/34, 1/44, 5/36, 43/16*
U.S. Cl. 229—2.5 R **12 Claims**



1. A food container comprising:

a. a tray having a tray bottom, a shallow end and a deep end opposite said shallow end; and a pair of opposed sides connecting between said ends; said ends and said sides being connected to and upstanding from said tray bottom; and

b. one or more troughs in said tray bottom, said troughs being below said tray bottom and having a bottom surface defining a plane angularly disposed with respect to the plane of said tray bottom the angle of said disposition opening in a direction toward said shallow end of said tray, said troughs being deeper at said shallow end than at said deep end of said tray, said troughs raising said shallow end with respect to said deep end when said tray is placed on a planar surface.

3,937,390

FISH BOX FOR STORING AND TRANSPORTING FISH

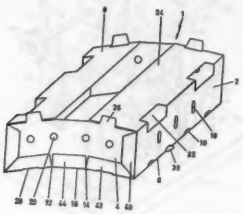
Klaus Winkler, Hattersheim, Germany, assignor to Ratio-Pack, Vienna, Austria

Filed Dec. 21, 1973, Ser. No. 427,272

Claims priority, application Germany, Dec. 21, 1972, 2262539

Int. Cl.² B65D *13/00*

U.S. Cl. 229—23 R 10 Claims



1. Fish box for the storage and transportation of fish and similar products, comprising impregnated corrugated cardboard forming a top, a bottom and side walls, said side walls having lateral water drain holes which extend to said bottom, said bottom of the fish box being higher in the centre than at two opposite sides, said top being higher in the middle than at said two opposite sides to complement said bottom.

3,937,391

CARDBOARD CONTAINER FOR BOTTLES AND THE LIKE

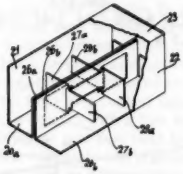
Heinz Focke, Moorstrasse, 309 Verden, Germany

Continuation-in-part of Ser. No. 83,581, Oct. 23, 1970, abandoned. This application Aug. 21, 1973, Ser. No. 390,263

Claims priority, application Germany, Oct. 23, 1969, 1953350

Int. Cl.² B65D *5/48*

U.S. Cl. 229—28 R 14 Claims



1. A container formed of foldable material and adapted to hold a plurality of segregated articles, the container having a wall structure formed by a unitary blank, said wall structure including integral top, side, bottom and end walls, said bottom wall being formed from two portions of said blank on opposite sides thereof, a flap coextensive in length with each bottom wall portion along an edge thereof on each of two opposite sides of the blank, the blank being folded into a hollow rectilinear form with said flaps extending upwardly into said container perpendicular to the bottom wall midway between the side walls thereof to define a longitudinal partition, at least one of said flaps having at least one transverse partition means integral therewith folded out of the plane of said flap at right angles thereto, said transverse partition means extending on opposite sides of said longitudinal partition, the other flap including an opening formed therein through which a selected portion of said transverse partition means extends to provide a single thickness transverse partition on opposite sides of said longitudinal partition and at least one transverse partition means integral therewith folded out of the plane of said other flap at right angles thereto, said transverse partition means of said other flap extending on opposite sides of said longitudinal partition, the transverse partition means of said other flap being longitudinally offset relative to the transverse partition means of said one flap and extending through an opening of said one flap.

3,937,392

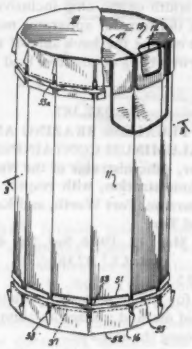
KNOCK-DOWN, COLLAPSIBLE, DRUM CONTAINER

Robert Allen Swisher, Long Valley, N.J., assignor to St. Regis Paper Company, New York, N.Y.

Filed Nov. 1, 1974, Ser. No. 520,125

Int. Cl.² B65D *5/36, 5/64*

U.S. Cl. 229—41 C 7 Claims



1. A knock-down, collapsible, drum container assembly, comprising in combination: a pair of polygonal, tubular members one adapted to fit within the other and comprising outer and inner tubular members of said container, each of said members being collapsible to a substantially flat state along oppositely disposed axially extending score lines thereof, end closures for said members comprising pairs of inner and outer closure caps, said inner closure caps being configured to fit within said outer tubular member at the opposite ends thereof and having integral therewith radially extending flaps bendable along score lines to bear against the inner wall of said outer tubular member, said inner tubular member being configured to fit within and bear against said flaps as so disposed, said outer closure caps being configured to span the ends of said outer tubular member and having integral therewith radially extending flaps bendable along score lines into engagement with the outer wall of said outer tubular member, whereby said flaps may be clamped against said outer wall by clamping rings bearing thereagainst.

3,937,393

TUBULAR HINGED LID CARTON

Robert W. Nerenberg, Middletown, Ohio, assignor to The Interstate Folding Box Company, Middletown, Ohio

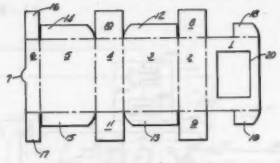
Filed Sept. 30, 1974, Ser. No. 510,807

Int. Cl.² B65D *5/54*

U.S. Cl. 229—51 TC 5 Claims

1. A tubular hinged lid carton having a body and an integral lid formed from a one-piece carton blank having at least a front wall panel, a bottom wall panel, a rear wall panel, a lid-forming top panel, and a front lid panel, hingedly connected together in the order named, full-depth end closure flaps hingedly connected to the opposite end edges of said front and rear wall panels, half-depth end closure flaps hingedly connected to the opposite end edges of said bottom wall panel, half-depth lid end panels hingedly connected to the opposite end edges of said lid-forming top panel, and half-depth attachment flaps hingedly connected to the opposite

end edges of said front lid panel, the said wall panels being erected relative to each other with said full-depth end closure flaps infolded and said half-depth end closure flaps infolded and adhesively secured to the lower portions only of said full-depth closure flaps to define the end walls of the carton



body, the lid-forming top panel being infolded with said front lid panel detachably secured to the said front wall panel, the half-depth lid end panels and the half-depth attachment flaps being infolded and secured together over the upper portions only of said full-depth end closure flaps to define a closed and sealed hinged lid carton.

3,937,394

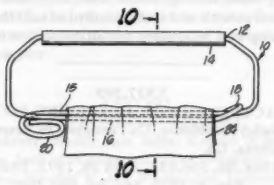
HANDLE FOR PAPER BAG

Carl O. Netschert, 633 Tularosa Drive, Los Angeles, Calif. 90026

Filed Jan. 27, 1975, Ser. No. 544,408

Int. Cl.² B65D *33/06*

U.S. Cl. 229—54 R **9 Claims**



1. A handle device for releasable engagement with the upper end of a flexible object, for example a paper bag, comprising:

a resilient wire-like member bent to the form of a closed loop of generally rectangular configuration having substantially parallel upper and lower sides,

the upper side of the closed loop serving as a carrying handle,

the lower side of the closed loop being formed by substantially parallel and coextensive, oppositely directed overlapped ends of the wire-like member to cooperate with each other to clamp the upper end of the object,

one of the two oppositely directed ends being a flexible clamp arm, the other of the two oppositely directed ends being a cross rod that terminally loosely engages the base of the clamp arm to complete the closed loop while permitting relative adjustment between the clamp arm and cross rod to various thicknesses of the object,

the outer end of the clamp arm being equipped with latch means for releasable engagement with the cross rod for clamping action on the object,

the clamp arm at its free position forming in cooperation with the cross rod a slot open at the free end of the clamp arm to permit the upper end of the object to be initially inserted edgewise into the slot into a position with the full width of the end of the object being folded over the clamp arm and extending back between the clamp arm and the cross rod, and

the clamp arm in its latched position being operative under the weight of the object to pull the clamp arm downward in a manner to press the object against the cross rod with increased clamping force, and to cause the cross rod to keep the object folded against itself for effective weight-bearing engagement of the object by the handle device.

3,937,395

VENTED BAGS

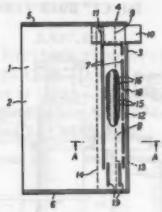
Norman Edward Lawes, Hutton Rudby, England, assignor to British Visqueen Limited, London, England

Filed July 22, 1974, Ser. No. 490,492

Claims priority, application United Kingdom, July 30, 1973, 36136/73

Int. Cl.² D65D *31/14*

U.S. Cl. 229—62.5 **6 Claims**



1. In a plastics-film bag having one wall formed by two longitudinally-overlapping panels joined one to the other by two spaced-apart longitudinal seals, the bag being provided with a vent comprising an interfacial air-channel between said overlapping panels and defined by said longitudinal seals, internal venting means comprising at least one aperture providing communication from inside the bag to said interfacial air-channel, and external venting means comprising at least one aperture providing communication from said air-channel to the atmosphere, the apertures of the internal and external venting means being laterally displaced relative to one another to provide an indirect path for air vented from inside the bag, the improvement comprising providing an uneven surface on at least one of the overlapping panels on its side facing said air-channel at least in an area adjacent to the internal venting means.

3,937,396

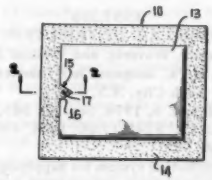
VALVE FOR VENTED PACKAGE

William S. Schneider, 10 Goodwill Road Extension, Weston, Conn. 06880

Filed Jan. 18, 1974, Ser. No. 434,611

Int. Cl.² B65D *31/14*

U.S. Cl. 229—62.5 **10 Claims**



1. A vented package comprising two walls of flexible material joined together to define a sealed enclosure, said walls having an area wherein at least a portion of said walls are joined together in an inside face-to-inside face seal, said face seal including a sealed enclosure defining portion and an

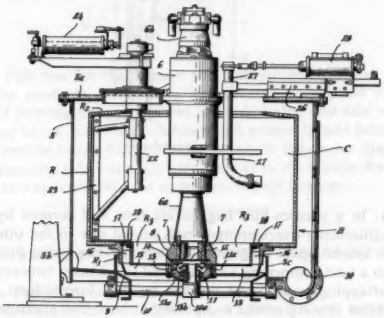
extension projecting into said sealed enclosure, and valve means for venting excess gas pressure from within said sealed enclosure, said valve means including a perforation through at least one of said walls in said seal area, and a resistance path to said perforation from within said sealed enclosure through said seal extension, said resistance path being of the type openable in response to gaseous pressure within said sealed enclosure for venting gases through said perforation, said resistance path being normally closed by a portion of said seal extension.

3,937,397

BASKET CENTRIFUGE

Ernest John Zitke, Stoughton, Mass., and Donald Dickinson Horton, Montclair, N.J., assignors to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Aug. 28, 1974, Ser. No. 501,459
Int. Cl.² B04B *11/04*
U.S. Cl. 233—3 **5 Claims**



1. In a basket centrifuge for separating a feed mixture of liquid and solids, the combination of a basket mounted for rotation about a vertical axis and having an outer portion forming a separating chamber, the basket including a central nave at its lower portion and also including a plurality of spoke-like tubes secured at their inner ends to the nave and at their outer ends to said outer portion of the basket, the basket having bottom openings partly defined by said tubes, means including a stationary feed duct for delivering said mixture into said tubes at their inner ends, a discharger shoe movable relative to the basket for plowing accumulated solids from the outer portion of the separating chamber, whereby the plowed solids fall through said bottom openings, and means forming feed distribution passages leading from the outer ends of the tubes and opening upwardly into the separating chamber at regions offset laterally from the tubes and extending along the radially outer portions of said bottom openings.

3,937,398

CONDITIONED AIR DISTRIBUTION SYSTEM

William J. Waeldner, Waverly, and William J. Harris, Tunkhannock, both of Pa., assignors to Dynamics Corporation of America, New York City, N.Y.

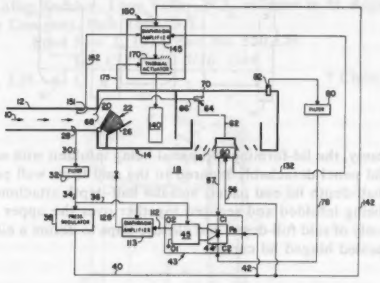
Filed Sept. 6, 1974, Ser. No. 503,784
Int. Cl.² F24F *11/00*; F15C *4/00*
U.S. Cl. 236—38 **15 Claims**

1. In an air distribution system for supplying conditioned air to at least one zone to be conditioned, the combination of:

a supply duct connected with a source of conditioned air under pressure and having an air outlet communicating with the zone;

a valve in said duct movable in duct opening and closing directions;

a control for said valve including a fluidic signal comparison and amplifying means, a fluid power supply conduit for the fluidic amplifying means connected with said duct, a thermostat providing a temperature responsive fluidic signal to said comparison and amplifying means, means providing a duct pressure signal to said comparison means, a valve actuator connected to the valve in the duct and operated by the comparison and amplifying means, said actuator being connected with said valve for movement of the valve in said duct opening and closing directions;



secondary conditioning means for further conditioning the air before it is introduced into the zone from the duct; and

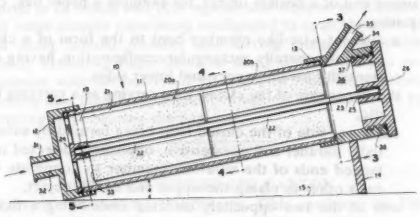
secondary conditioning fluidic control means operable in conjunction with and under control of said thermostat for regulating said secondary conditioning means.

3,937,399

JET ACTION CHEMICAL FEEDING METHOD

James L. Halley, Mableton, Ga., assignor to Tesco Chemicals, Inc., Marietta, Ga.

Division of Ser. No. 566,833, April 10, 1975. This application Aug. 4, 1975, Ser. No. 601,260
Int. Cl.² E03C *1/046*; C02B *1/36*; E04H *3/20*
U.S. Cl. 239—1 **6 Claims**



1. The method of feeding a chemical into a liquid by directing a flow of liquid along a soluble chemical composition, comprising the steps of:

directing a flow of liquid upwardly along a confined path which is inclined with respect to horizontal;

passing said flow of liquid along at least one surface of a solid body of a soluble chemical composition which may produce a gaseous fluid in response to said liquid flow; and

removing said flow of liquid from an upper end of said confined path, so that said gaseous fluid is removed from said confined path along with said liquid flow.

3,937,400

APPARATUS FOR SPRAYING PAINT

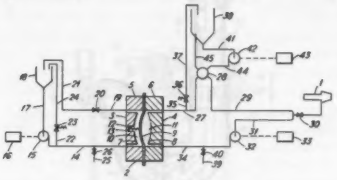
Janusz Josef Henryk Krause, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 7, 1974, Ser. No. 521,932

Claims priority, application United Kingdom, Nov. 26, 1973, 54754/73

Int. Cl.² B05B 17/04, 9/04, 5/02

U.S. Cl. 239—11 8 Claims



1. In a method of coating a metal anode with electroconductive paint with an electrostatic spray gun while maintaining said gun at a high electrical potential and said anode at ground potential, the improvement which comprises: providing a diaphragm assembly having a flexible diaphragm separating a paint pumping chamber containing sufficient paint to coat the entire surface of the electrode and a pressurizing chamber; connecting the pumping chamber to the spray gun; introducing non-compressible fluid into the pressurizing chamber at a uniform continuous non-pulsating rate so that the diaphragm flexes and delivers the paint in the pumping chamber to the spray gun at said uniform continuous non-pulsating rate; and spraying the delivered electroconductive paint from the spray gun onto the surface of the anode at said uniform continuous non-pulsating rate.

3,937,401

ELECTROSTATIC COATING

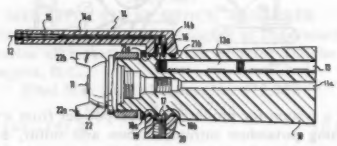
Manfred Luderer, Weiler zum Stein; Roland Wiedmann, and Karl Rapp, both of Winnenden, all of Germany, assignors to Firma Ernst Mueller K. G., Winnenden, Germany

Filed Apr. 1, 1974, Ser. No. 456,827

Claims priority, application Germany, Apr. 6, 1973, 2317448; Jan. 17, 1974, 2402209

Int. Cl.² B05B 5/00

U.S. Cl. 239—15 11 Claims



1. In an electrostatic coating gun suitable for coating objects with liquid or powdery coating material of relatively high electrical conductance, the gun having a housing with a coating material feed line disposed therein for connection to a coating material supply source, an atomizer nozzle located at a discharge end of said feed line, an electrode for statically charging atomized coating material particles, and means for connecting an electrical resistor means and high voltage cable to said electrode, the improvement comprising:

an elongated, electrode extension body of insulating material carrying said electrode forwardly of a discharge opening means of said nozzle; and

electrical conducting means disposed in said extension body and being electrically connected to an electrical contact on said housing;

said electrical contact on said housing being electrically connectible to the high voltage cable;

said extension body being disposed to locate said electrode forwardly of said nozzle discharge opening means at a distance therefrom which is selected in accordance with the conductivity of said coating material so that the voltage drop at said electrical resistor means is below a predetermined minimal value such that an intensive charging of said highly conductive coating material particles is effected;

said extension body being mounted for rotation about a longitudinal axis extending through said housing in a manner maintaining said distance constant so that said electrode can be rotatably displaced relative to the spray of coating material without changing said distance between said electrode and said nozzle discharge opening means.

3,937,402

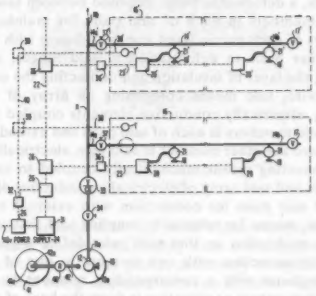
FLUID DISTRIBUTION SYSTEM

Grady W. Query, 3534 Central Ave., Charlotte, N.C. 28205

Continuation-in-part of Ser. No. 373,879, June 26, 1973, abandoned. This application Mar. 27, 1974, Ser. No. 455,079

Int. Cl.² B05B 12/02

U.S. Cl. 239—70 11 Claims



1. A distribution system for a combination of liquid and gas comprising:

a. a main conduit through which said combination may flow;

b. a plurality of branch conduits through which said combination may flow connected to said main conduit at one end and closed at the other end;

c. a plurality of spray nozzles connected on each of said plurality of branch conduits;

d. a plurality of valve means, one on each of said plurality of spray nozzles, operable to control flow of said combination through each of said plurality of spray nozzles;

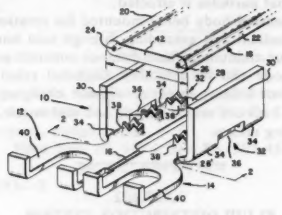
e. flow control means for introducing said combination of a liquid and a gas into said main conduit and thereby to said plurality of branch conduits including a supply source, and for maintaining said combination of a liquid and gas in similar proportions in said main conduit and said plurality of branch conduits as it is in said supply source; and f. a booster source operative to compensate for pressure loss of said combination of liquid and gas throughout said distribution system.

3,937,403

ELECTRICAL TERMINALS FOR FLAT WIRE

Gustaf Rudolph Lawson, Willingboro, N.J., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 404,086, Oct. 5, 1973, abandoned. This application June 3, 1974, Ser. No. 475,708
Int. Cl.² H01R 11/20
U.S. Cl. 339—97 C 5 Claims



1. A pair of terminals capable of being secured to a television antenna wire or the like wherein said wire comprises a layer of substantially flat insulation of predetermined width having two spaced conductors therein so that each of said terminals is electrically connected to one of said conductors wherein, each of said terminals being substantially a mirror image of the other and comprising a pair of plate-like members, each of said pairs comprising first and second plate-like members, a deformable hinge disposed between said first and second members in each of said pairs for maintaining said members of each pair in fixed angular relation with respect to each other prior to deformation of said hinges, means for piercing the layer of insulation and contacting the conductors in the wire, said means comprising an array of insulation piercing, electrically conductive elements coupled to at least one of said members in each of said pairs and extending generally toward the other member in said pair, electrically conductive connecting means mechanically coupled to one of said members and said array of electrically conductive elements in each of said pairs for connection with external conductive members, means for releasably coupling said first and second pairs to each other so that said pairs define a generally U-shaped cross-section with one member in one of said pairs being coplanar with a corresponding member in the other pair, said members cooperating to form the base of said U and the other member in each of said pairs cooperating to form the legs of said U, the distance between said legs being slightly larger than the predetermined width of the wire, the two pairs of members thus cooperating to form a single locating area for receiving the antenna wire so that the wire can be received therebetween while its lateral movement is restricted thereby to maintain the conductors in alignment with their corresponding array of electrically conductive elements, said legs positioning said wire while the wire is pressed between said first and second members in each of said pairs and said arrays of electrically conductive elements pierce the layer of insulation comprising the wire to make electrical contact with their corresponding conductor while said terminals are coupled to each other.

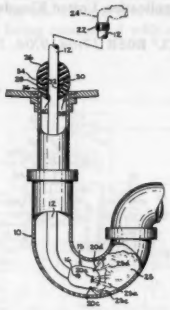
3,937,404

DRAIN DECLOGGING DEVICE

Arthur L. Johnson, 4921 3rd St., San Francisco, Calif. 94124

Filed June 9, 1975, Ser. No. 584,738
Int. Cl.² B05B 1/14, 1/18; B08B 9/06
U.S. Cl. 239—567 5 Claims

1. A drain-declogging device comprising a length of flexible hose of a size to fit into a drain pipe, having at one end thereof means for attaching it to a source of water under pressure and at the other end a nozzle of elliptical contour having in one of its short sectors an entrance passage adapted to receive the respective end of said hose and reaching to a central area of said hose, and extending obliquely outwardly from said passage to the outer surface of the flank area of the opposite short sector of said nozzle a plurality of circumferentially spaced



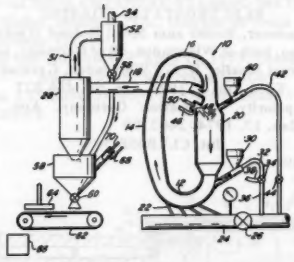
flat passages terminating in slot-shaped orifices, and slidably engaged over the center portion of said hose intermediately of its ends, means for blocking back flow of water in said drain around and exteriorly of said hose.

3,937,405

APPARATUS FOR MIXING PULVERIZING AND GRINDING BLACK POWDER

Nicholas N. Stephanoff, Haverford, Pa., assignor to Fluid Energy Processing and Equipment Company, Hatfield, Pa.

Division of Ser. No. 425,938, Dec. 18, 1973. This application Dec. 4, 1974, Ser. No. 529,373
Int. Cl.² B02C 19/06
U.S. Cl. 241—39 6 Claims



1. In a system for producing black powder from a mixture comprising potassium nitrate, carbon and sulfur, a mill of curvilinear shape having an inlet section, an upstack section leading from said inlet section, and a classifier section connecting said upstack section to a downstack section, said downstack section leading into said inlet section, all of said sections being in fluid connection with each other, a plurality of gaseous fluid nozzles connected to a source of high pressure gaseous fluid, said nozzles leading tangentially into said inlet section, feed means for said potassium nitrate, carbon and sulfur, said feed means leading into said mill adjacent said downstack, said downstack having at least a portion thereof expanded relative to the remainder of said mill, and an exhaust outlet from the inner peripheral wall of said mill between said classifier section and said downstack section, and a feed means for the carbon and sulfur, the feed means for the potassium nitrate being provided separately from the feed means for the carbon and sulfur, the feed means for the potassium nitrate being upstream from said expanded portion of

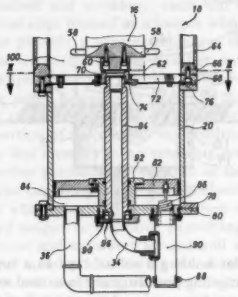
said downstack section and the feed means for the carbon and sulfur being downstream from said expanded portion.

3,937,406

AGITATOR MILL

Norbert Klimaschka, Selb, Germany, assignor to Gebruder Netzsch Maschinenfabrik, Selb, Germany

Filed May 29, 1974, Ser. No. 474,183
Int. Cl.² B02C 17/18
U.S. Cl. 241—46.11 8 Claims



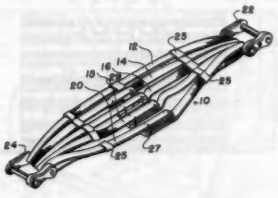
1. An agitator mill comprising
a grinding container,
an agitator shaft rotatable therein,
a charge of grinding elements contained in said grinding container,
a cylinder mounted at the lower portion of said grinding container and opening into said grinding container, containing,
piston means displaceable in said cylinder,
and hollow guide rod means attached in said cylinder for guiding said piston means and simultaneously forming the inlet for material to be ground in the agitator mill,
said cylinder receiving at least a portion of said charge of grinding elements, and thus reducing the packing density of said charge of grinding elements in said grinding container, when said piston means is in its lowermost position.

3,937,407

MULTIPLE STRAP SHOCK ABSORBER

Jon T. Matsuo, El Centro, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1974, Ser. No. 473,252
Int. Cl.² B64D 17/36
U.S. Cl. 244—151 R 10 Claims



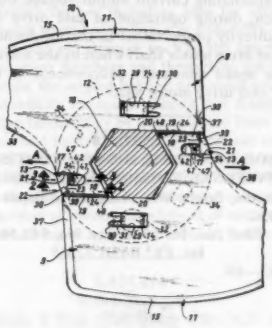
1. A shock absorber comprising a pair of spaced load attaching fittings;
a plurality of elongate tear members extending between and having their ends operatively connected between said fittings;
all of said tear members being made of the same material having equal cross-sections and predetermined physical characteristics;
said tear members extending for a portion of their length substantially in a common plane, in lateral side-by-side relationships;
said tear members each being progressively longer in effective parting length;
the effective lengths of said tear members being constructed so that a tensile force between said fittings is applied to at least two adjacent tear members simultaneously causing the force to be transferred between the tear members smoothly and continuously as the tear members are successively parted.

3,937,408

BLADE ARRANGEMENT FOR A MEAT CUTTER

Immanuel Buck, Flurstrasse 15, 7012 Feilbach, Germany

Filed Nov. 29, 1974, Ser. No. 528,449
Claims priority, application Germany, Nov. 29, 1973, 2359539; July 25, 1975, 2435796; Oct. 23, 1974, 2450421
Int. Cl.² B02C 18/18
U.S. Cl. 241—282.2 17 Claims



1. A blade arrangement for meat cutters comprising a driven shaft on which form-locking disks are disposed adjacent to each other, a blade group, preferably comprising two identical blades being disposed between adjacent disks, and the disks being braced together in the axial direction of the shaft and the flange head of each blade being guided in a radial direction on fixed guide surfaces on at least one of the adjacent disks, characterized in that the edges of the flange heads of each blade of at least one blade group which are guided by the guide surfaces consist of one or more outer edges of the flange head and one or more straight edge region of at least one opening in the flange head and in that the guide means for the outer edge in question or the particular outer edges of the flange head is formed by at least one bar projecting beyond an adjacent disk and the guide means for the straight edge region or regions of the opening consists of at least one pin engaging in the opening.

3,937,409

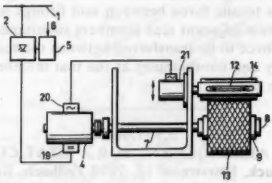
ELECTRIC DRIVE FOR FIBER OR THREAD WINDING MACHINES AND METHOD OF OPERATING WINDING MACHINES

Artur Muller, Karlsruhe, Germany, assignor to Industrie Werke Karlsruhe Augsburg AG, Germany

Filed Apr. 10, 1974, Ser. No. 459,577
Claims priority, application Germany, Apr. 16, 1973, 2319128
Int. Cl.² B65H 54/02, 54/40
U.S. Cl. 242—18 R 11 Claims

1. An apparatus for driving winding devices, such as a device for winding thread on a bobbin using a thread traverse

system for moving the thread backwardly and forwardly as the bobbin is revolved, comprising a drive motor having a rotatable shaft with an armature winding, a commutator connected to said armature winding for connecting the winding to a source of direct current and a plurality of slip rings connected to said armature winding so that a symmetrical polyphase alternating current voltage is produced at the rings during rotation of said shaft, means on said shaft for driving the



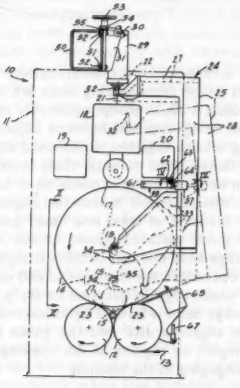
bobbin, and a synchronous motor having a rotatable synchronous motor shaft connected to rotate the thread traverse system and being connected to said slip rings for receiving a polyphase alternating current output voltage from said drive motor which, during operation of said drive motor, has a frequency directly proportional to the mechanical rotational speed of said drive motor shaft whereby the traverse system is driven at a speed constantly proportional to the speed of rotation of said drive motor shaft.

3,937,410

METHOD OF AND MEANS FOR CONTROLLING INTERNAL TENSION IN WEB ROLLS

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 16, 1975, Ser. No. 541,505
Int. Cl.² B65H *17/08*
U.S. Cl. 242—66 **20 Claims**



1. A method of controlling internal lineal tension in web rolls during winding thereof about cores with the aid of winding drums, comprising:

partially winding the web rolls between nips at the winding drums and a rider roll which acts through the web rolls to provide controlled tensioning load to said nips until the weight of the web rolls themselves provides sufficient self-loading on the nips for lineal tensioning of the webs in the rolls;

then releasing the rider roll from the web rolls; and

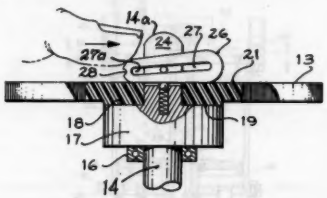
during continuance of winding the web rolls to full desired diameter applying load relieving lift to the web rolls through their cores to maintain the web tensioning load at said nips at a substantially optimum value as web load weight increases.

3,937,411

TAPE ROLL HOLD-DOWN DEVICE

Charles A. Vogel, and William T. Lombardi, both of San Jose, Calif., assignors to American Videonetics Corporation, Sunnyvale, Calif.

Filed May 23, 1974, Ser. No. 472,536
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68.3 **7 Claims**



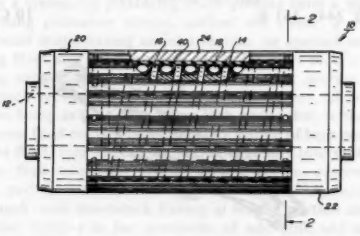
1. A device for holding a roll of tape to a support surface comprising a mounting post disposed to extend away from said surface and adapted to receive thereon a roll of tape of a type including a hub having a mounting opening formed centrally thereof for receiving said post therethrough, an elongate toggle opening formed substantially in the plane of a diameter of said post, the axis of said post lying substantially in said plane, an elongate toggle member disposed within said toggle opening and formed with an elongate slot therein, pivot means cooperating with said slot for supporting said toggle member within said toggle opening, the displacement between one end of said slot and the adjacent peripheral extremity of said toggle member being less than the displacement between the axis of said pivot means and the nearest edge of said mounting opening to permit said toggle member to pivot to a position sufficiently aligned with said post to pass said hub thereover and onto said post to a position permitting said toggle member to lie crosswise of said post and against the outer side face surface of said hub on opposite sides of said post simultaneously.

3,937,412

EXPANDING OUTER SLEEVE FOR A MANDREL OR CHUCK

Lawrence R. Damour, 16 Chesler Square, Succasunna, N.J. 07876

Filed Apr. 23, 1975, Ser. No. 570,562
Int. Cl.² B65H *75/18*
U.S. Cl. 242—72 B **10 Claims**



1. A circumferential sleeve assembly which is mounted in and on an expanding mandrel, spool shaft and the like and which provides a core support for said mandrel, and in which the expansion means for the sleeve assembly is at least one

resilient tube carried by a body member and in which there is provided means for selectively feeding and releasing air, fluid and the like from said resilient tube, said mandrel and sleeve assembly including: (a) a body member; (b) at least one resilient tube carried in and by said body member; (c) end member means carried by said body member, said end member means providing confining limits for the tubing and also establishing the overall length of the body member; (d) a circumferential sleeve assembly carried by the body member and between the limits established by the confining end members, this sleeve assembly further including; (d1) a multiplicity of serially connected leaf members, each leaf member having one longitudinal edge formed as a tongue whose outer portion is enlarged to provide a greater thickness than the portion connecting the tongue to the leaf member, and with the other longitudinal edge of the leaf member formed with a retaining groove whose outer entryway is narrower than the enlarged outer portion of the tongue, said entryway freely passing said connecting portion of the tongue, the resulting assembly of a tongue of one leaf member into a retaining groove of an adjacent leaf member providing a retention of the tongue in the groove with the capturing of the enlarged portion preventing dislodgement while providing a determined amount of play, this assembled tongue in a groove permitting limited movement of adjacent leaf members toward and away from each other; each leaf member also having at least one undergroove formed therein and extending with the longitudinal extent of the leaf member, said undergroove disposed to extend inwardly from the undersurface of the leaf member when the leaf member is in an assembled condition, and (d2) a multiplicity of elastic tension member strips, each having a base portion and from this base portion there is integrally attached extending tab portions which are shaped and sized for retentive mounting in the undergrooves of the leaf members, said elastic strips in a mounted condition extending from one leaf member to an adjacent member with one of the tabs in the undergroove of one leaf member and the other tab in an undergroove of an adjacent leaf member, said elastic tension member when in mounted condition being slightly stretched so as to draw toward each other the leaf members to which they are secured, the connected leaf members of a sleeve assembly being positioned over the resilient tube so that when said tube is expanded the leaf members are urged outwardly by the expansion of the tube and with an outward diametrical limit being established by the play of the tongue in the groove, and when the pressure in the tube is decreased the stretched elastic tension members draw the leaf members toward and to the body member.

3,937,413

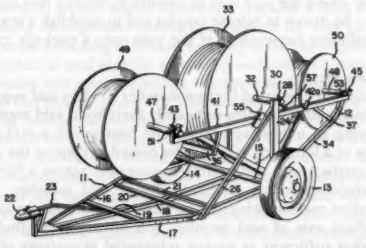
DUAL FRAME ROCKER TRAILER

Joseph C. Devine, R.D. No. 1, Box 206, Grantville, Pa. 17028

Filed June 13, 1974, Ser. No. 478,929

Int. Cl.² B65H *75/00*; B60P *1/04*

U.S. Cl. 242—86.5 R **3 Claims**



1. A dual frame rocker trailer for the carrying of cable reels supported by reel bars, of varying size and weight comprising:

A. a main frame having an attached set of wheels and comprising; (i) a yoke-shaped structure comprising two rails parallel at their rear extremities and converging and joined at their forward extremities and being in a substantially horizontal plane; (ii) stationary upright members depending upwardly from each of said rear extremities, each having (iii) a reel bar mounting means attached at each upper end of the stationary upright support member; and

B. a rocker frame comprising a pair of connected, substantially triangular-shaped rail frames lying in parallel vertical planes and opposing and parallel to one another; pin means pivotally connecting an angled portion of each of said triangular -shaped rail frames to said main frame at or near the locations where said stationary upright members depend upwardly from each of said extremities, and each of said substantially triangular-shaped rail frames having reel bar support means at opposing ends and further characterized in that each stationary upright support member of the main frame has an aperture at a point lower than the reel bar support, and the rail opposite said angled portion of pivotal attachment of each of the substantially triangularshaped rail frames further characterized as having a plurality of apertures; said dual frame rocker trailer further including pins for attaching said rocker frame to said main frame in a plurality of positions by passing said pin through each of the apertures of the upright support members and through an aperture of the rail opposite the angled portion of pivotal attachment of the substantially triangular-shaped rail frame, and said main frame further may be disconnected from said rocker frame and said rocker frame tipped forward or backward so that the reel bar mounting means at each upper end of said stationary upright support member becomes aligned in a level position with a respective rail opposite the angled portion of pivotal attachment of said rocker frame for the receiving of a cable reel bar in loading.

3,937,414

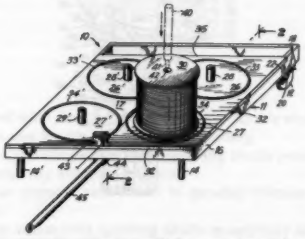
WIRE DOLLY

Morton L. Bank, 8 First St., Garden City, N.Y. 11530, and Ronald J. Spieler, 90 Calla Ave., Floral Park, N.Y. 11001

Filed Nov. 25, 1974, Ser. No. 527,091

Int. Cl.² B65H *75/40*

U.S. Cl. 242—86.5 R **10 Claims**



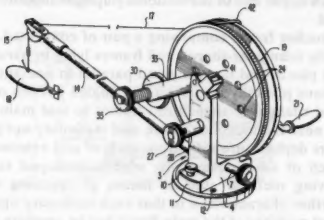
1. A dolly for carrying spools of wire to a construction site for on-site use thereof without removal thereof from the dolly comprises a carriage including a carriage bed, at least one turntable rotatably mounted on said carriage bed, means for releasably mounting a spool of coiled wire on said at least one turntable, an overfitted cover plate releasably overlying said carriage bed, said overfitted cover plate having at least one aperture therein in which said at least one turntable is registered, said overfitted cover plate being foreshortened relative to the length of said carriage, and an accessory bin being defined between said foreshortened end of said overfitted cover plate and a corresponding end of said carriage for storing installation equipment and the like.

3,937,415

DOWNRIGGER

John Prinz, 1303 W. Carmen, Chicago, Ill. 60640

Filed May 16, 1973, Ser. No. 360,818
Int. Cl.² A01K 89/00
U.S. Cl. 242—106 7 Claims



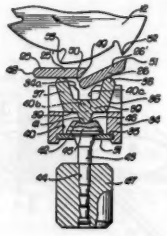
2. An outrigger type trolling equipment, comprising a pedestal, a reel adapted for winding a line thereon, means journaling the reel on the pedestal for turning movement about an axis, said reel having a rim, a drag wheel having a friction surface in position to bear upon the rim of the reel, an elongated arm supporting the drag wheel at one end thereof, and means pivotally mounting the opposite end of the arm on the pedestal for swinging movement of the arm about an axis spaced from the axis of the reel, said axis of swinging movement being operably positioned to cause the drag wheel to bear with increased pressure on the wheel when the wheel is rotated to unwind the line and to cause the drag wheel to release pressure on the wheel when the wheel is rotated to wind the line.

3,937,416

REEL FOR STORING BELTS OR THE LIKE

Cyril Henderson, Woodland Hills, Calif., assignor to American Safety Equipment Corporation, Encino, Calif.

Division of Ser. No. 353,211, April 20, 1973. This application Mar. 20, 1975, Ser. No. 560,371
Int. Cl.² B65H 75/48
U.S. Cl. 242—107.4 A 3 Claims



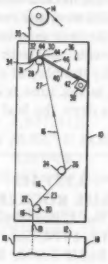
1. A reel for storing a belt or the like thereon comprising:
a frame having a shaft journalled for rotation thereon;
a belt having one end connected to said shaft and adapted to be wound about said shaft;
spring means associated with both said shaft and said frame to revolve said shaft in a direction retracting said belt about said shaft;
a ratchet tooth gear circumferentially mounted on said shaft and rotatable therewith, said ratchet tooth gear having a plurality of spaced teeth thereon extending in the direction opposite the direction of revolution of said shaft by said spring means; and
means mounted on said frame for stopping the rotation of said shaft in the direction opposite the direction of revolution of said shaft by said spring means, said means including a pair of lockbars mounted on said frame, each of said lockbars having a pawl tip movable from a first position out of engagement with said ratchet tooth gear in a direction generally normal to the axis of rotation of said gear to a second position in engagement therewith, said pawl tips in said second position being spaced such that when the pawl tip of one of said lockbars is generally radially aligned with one of the teeth of said ratchet tooth gear the other of said pawl tips of the other of said lockbars is aligned midway between a pair of adjacent gear teeth of said ratchet tooth gear, said means mounted in said frame including differential lever means operatively engaging said lockbars for moving said lockbars between said first and second positions, said lever means having first and second portions thereon engaging each of said lockbars and a third portion thereon, and means associated with said frame operatively engaging said third portion to actuate said lever means in a manner whereby said lever means moves said lockbars between said first and second positions, said last-mentioned means moving to a lever means actuating position in response to inertia acting on said lastmentioned means, and said differential lever means including a reversing lever having each of said lockbars fixedly mounted thereon, said third position being the underside of said lever, said inertia responsive means including a weighted member having an integral upper head portion, the upper surface of which bears against the underside of said lever for moving said lever when said weighted member is moved between positions actuating said lever means.

3,937,417

APPARATUS FOR TENSIONING YARN

Lloyd M. Guenther, Severna Park, Md., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 28, 1973, Ser. No. 429,055
Int. Cl.² B65H 59/10, 59/24, 59/26
U.S. Cl. 242—147 R 2 Claims



1. Yarn tension apparatus through which yarn from a reservoir where the yarn is in an essentially tension free condition may be drawn to release tangles and to establish a tension level sufficient for winding of the yarn onto a package, comprising
support means;
a stationary elongated friction member fixed to said support means and protruding outwardly therefrom, said member having an unobstructed free end over which a mid-portion of a length of yarn may be passed to dispose the yarn in contact with and leading transversely across a friction surface extending longitudinally of said member, said friction surface being curved transversely about the longitudinal axis of said member and having a longitudinal extent sufficient to permit substantial migrations of the yarn along the friction surface during tangle release events without the yarn passing off the unobstructed free end of the friction member; and

a control member mounted on said support means for swinging movement about an axis spaced from but parallel to the longitudinal axis of said friction member, said control member having an unobstructed free end opposite said support means and including

a longitudinally elongated, transversely curved portion adapted to swing toward said curved friction surface of said friction member to press a yarn portion against such surface when tension is released, so as to engage said yarn portion between said curved portion and said friction surface to inhibit accidental unthreading of the yarn from between said friction member and said control member by yarn movement along the length of the yarn, and

a yarn guide portion spaced from said curved portion on the side thereof opposite the pivot axis, said yarn guide portion including a longitudinally elongated guide surface about which the yarn may pass in a direction such that an increase in yarn tension tends to swing said control member away from said friction member to reduce the length of the arc of frictional contact between the yarn and said friction surface and thereby effect a tension reduction tending to compensate for said tension increase,

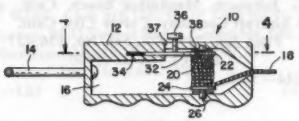
said curved portion of said control member and said yarn guide portion of said control member being fixed relative to each other so that any movement of said yarn guide portion results in movement of said curved portion.

3,937,418

RETRACTABLE DOG LEASH

Frank Critelli, Pompano Beach, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 13, 1975, Ser. No. 540,691
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107.4 R **1 Claim**



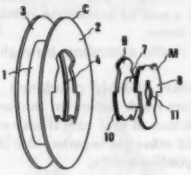
1. A retractable dog leash comprising a housing elongated in a longitudinal direction; an aperture at one end of said housing communicating from the interior to the exterior of said housing; a reel journalled within said housing for rotation about an axis generally perpendicular to said longitudinal direction; a cord wound about said reel and having a free end passing through said aperture; means on the free end of said cord for attaching said cord to a dog collar; first spring means coupled to said reel for torqueing said reel in a direction for winding said cord thereon; a ratchet wheel coupled fixedly to said reel coaxial therewith, said ratchet wheel having a plurality of recesses about its periphery; an elongated longitudinally directed member mounted slideably within said housing radially of said ratchet wheel, said elongated member having an end facing said ratchet wheel configured for engagement with one of said recesses for blocking rotation of said reel; second spring means for urging said elongated member into engagement with said ratchet wheel; a longitudinally elongated slot in a side of said housing; and a shaft projecting perpendicularly and fixedly from said elongated member and through said slot to enable moving said elongated member out of engagement with said ratchet wheel.

3,937,419

SPOOL FOR FISHLINE

Gerard Bon, Blois, France, assignor to La Soie, Blois, France

Filed Mar. 7, 1974, Ser. No. 449,002
Claims priority, application France, Mar. 9, 1973, 73.11704
Int. Cl.² B65H *75/14*
U.S. Cl. 242—118.4 **20 Claims**



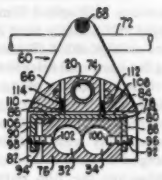
1. A spool for line comprising an annular member and a hub member, said annular member including a hollow core and a pair of axially spaced radially outwardly directed peripheral flanges between which line is adapted to be wound and unwound, said hub member being housed substantially entirely within said hollow core, and frangible means interlocking said annular member and said hub member together for simultaneous unified rotation about an axis of rotation of said hub member in an unbroken condition of said frangible interlocking means and providing free relative rotation between said annular member and said hub member in a broken condition of said frangible interlocking means.

3,937,420

LEVEL WIND DEVICE

Alex J. Galis, Heatherbrae Square, Apt. 101, Indiana, Pa. 15701

Filed Oct. 29, 1971, Ser. No. 193,642
Int. Cl.² B65H *54/30*
U.S. Cl. 242—158.4 A **2 Claims**



1. A level wind device for distributing a flexible strand along more than one length of traverse comprising,

a pair of spooling shafts, said spooling shafts positioned in substantially abutting relation,

means to support said shafts in parallel relation to each other,

means to rotate said spooling shafts in opposite directions,

each of said spooling shafts having a cylindrical outer surface with a thread formed therein having a preselected pitch, each said thread forming a spiral cam track in a respective shaft cylindrical outer surface,

strand distributing means including a yoke member positioned over both of said spooling shafts with depending end portions for transverse movement relative to said spooling shafts,

said yoke member depending end portions having pin members extending inwardly toward said spooling shafts and arranged to be alternately positioned in a respective one of said cam tracks so that upon rotation of said spooling shafts said strand distributing means with one of its pin members engaging a respective one of said cam tracks

moves longitudinally of one of said spooling shafts in a first direction to the end of said respective cam track and thereafter said yoke member moves transversely to said spooling shafts and positions said other pin member in the other of said cam tracks of the other of said spooling shafts and moves said strand distributing means longitudinally in the opposite direction to the end of said other cam track,

a rider block having a pair of longitudinal bores therethrough and a pair of transverse bores opening into said longitudinal bores,

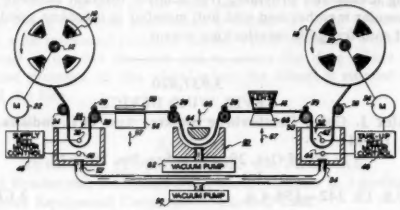
said spooling shafts extending through said longitudinal bores,

said pin members slidably positioned in said transverse bores, and cam track means for moving said pin member positioned in one of said cam tracks out of said one cam track and said other pin member into the cam track of the other said spooling shafts.

3,937,421
ASYNCHRONOUS HIGH-SPEED PNEUMATIC FILM TRANSPORT MECHANISM

William D. Fender, Pasadena, and Gordon Sohl, Arcadia, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 1, 1971, Ser. No. 203,615
Int. Cl.² G11B 15/58, 23/12
U.S. Cl. 242—182 **6 Claims**



1. In an asynchronous high-speed film transport apparatus which includes supply and take-up reels about which opposite ends respectively of an elgonated film may be wound, a pair of drive motors one for each reel selectively operable to rotate the reels respectively to move film along a path from one reel to the other, a read/record station being positioned between said first and second reels, first and second film vacuum chambers associated respectively with said first and second reels, each chamber arranged to hold a loop of film, the chambers being positioned adjacent the film path between the reels, means connected to the drive motors for producing movement of the film and means for maintaining a predetermined loop of film in each of the chambers during film movement, the improvement comprising:

means for providing variable-width frames of film for predetermined film advance positioned between said first and second vacuum chambers along the film transport path,

first film clamp means located between the first vacuum chamber and said frame providing means,

second film clamp means positioned at the opposite side of said frame providing means,

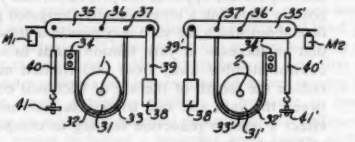
said first and second clamp means and said frame providing means being operated in a manner such that successive frame-by-frame movement of said film is provided relative to said read/record station,

said frame providing means includes a movable member which is positioned adjacent one surface of the film to vary the amount of film in said frame providing means in response to a signal which corresponds to a desired amount of film advance, and further includes means for applying a substantially uniform pressure on the other surface of the film in said frame providing means and said pressure-applying means cooperates with said movable member to define each predetermined frame width for film advance.

3,937,422
MAGNETIC TAPE RECORDING AND REPRODUCING MACHINES

Tomomi Kato, Tokyo, Japan, assignor to Sansui Electric Co., Ltd., Tokyo, Japan

Filed Nov. 30, 1973, Ser. No. 420,518
Claims priority, application Japan, Dec. 1, 1972, 47-137576[U]
Int. Cl.² G11B 15/22; B65H 25/32
U.S. Cl. 242—204 **7 Claims**

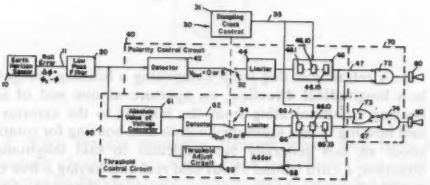


1. A brake mechanism for a rotatable shaft for carrying a tape reel in a magnetic tape recording and reproducing machine comprising AC electric motor means to drive said shaft, mechanical brake means operable to brake said rotatable shaft, DC electric current supply means, switch means adapted to detect displacement of said brake means caused by the braking friction between said brake means and said shaft while said shaft is rotating and thereby feed a DC current from said DC current supply means through the windings of said AC motor means to electromagnetically brake the same.

3,937,423
NUTATION AND ROLL ERROR ANGLE CORRECTION MEANS

Donald G. Johansen, Manhattan Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Jan. 25, 1974, Ser. No. 436,427
Int. Cl.² B64C 15/00
U.S. Cl. 244—3.22 **26 Claims**



1. An attitude control system for providing multiple axes control to a vehicle, comprising in combination:

a plurality of jet thrustors spaced from each other at predetermined locations at the outer periphery of the vehicle;

an electronic control circuit including shift registers and a logic network connected to said jet thrustors for periodically imparting activation of any of the thrustors so as to correct offset of the vehicle attitude with respect to a predetermined direction; and

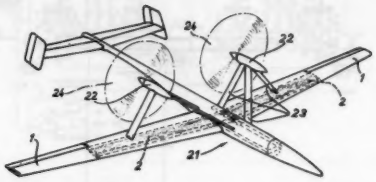
a rotatable momentum wheel within said vehicle having a single degree of freedom, said wheel being independent in its rotational action of the attitude of the vehicle, said electronic control circuit being non-responsive to rotational action of said wheel.

3,937,424

ELECTRICALLY POWERED AIRCRAFT

Hans Justus Meier; Herbert Sadowski, both of Bremen, and Ulrich Stampa, Bremen-Schonebeck, all of Germany, assignors to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed Nov. 1, 1974, Ser. No. 520,159
Claims priority, application Germany, Nov. 16, 1973, 2357286
Int. Cl.² B64D 27/02
U.S. Cl. 244—53 R 13 Claims



1. An electrically powered aircraft having wings and fuselage and at least one electric motor for driving a propeller or the like for obtaining propulsion for the craft and having battery means as an electrical power source, the improvement comprising, of load bearing central wing cases for each wing, having transverse walls extending over the entire height of a wing in each instance and spaced apart in the direction of flight, each case further having profiled top and bottom plates secured to the transverse walls in liquid tight sealing manner, and for reaction and transfer of forces between the top and bottom plates, and the walls of the respective case;

electrode plates in said central wing case which is filled with electrolytic liquid to draw electric power therefrom; and

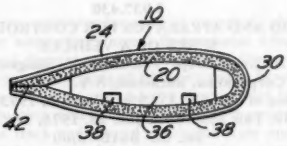
leading and trailing edge defining wing cases respectively secured to said transverse walls to complete a wing profile together with outer surfaces of the top and bottom plates.

3,937,425

AIRPLANE WING AND METHOD OF FORMING SAME

William B. Harvey, 8932 Footed Ridge, Columbia, Md. 21045

Filed Apr. 19, 1974, Ser. No. 462,397
Int. Cl.² B64C 3/26
U.S. Cl. 244—123 21 Claims



1. A method of forming an airplane wing including the steps of:

a. providing a planar structural member composed of plastic foam between opposing paper sheets;

b. removing a substantial portion of one of said paper sheets from said plastic foam to form an inner surface of said airplane wing composed of said plastic foam and said paper sheet;

c. establishing a leading edge region of said wing extending a predetermined transverse distance with respect to a longitudinal extension of said structural member;

d. compressing said leading edge region throughout said longitudinal extension of said planar structural member;

e. shaping said structural member into a predetermined contour; and,

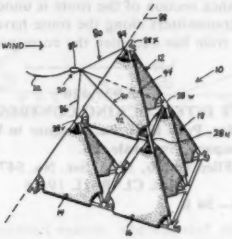
f. securing opposing ends of said structural member each to the other to form said airplane wing.

3,937,426

TETRAHEDRAL KITE STRUCTURE

Peter J. Pearce, Studio City, Calif., assignor to Synestructics, Inc., Chatsworth, Calif.

Filed Nov. 9, 1973, Ser. No. 414,531
Int. Cl.² B64C 31/06
U.S. Cl. 244—153 R 13 Claims



1. A tetrahedral kite comprising:

a frame having struts of a rigid material arranged along the edges of a tetrahedral geometric figure; and

a sail covering a pair of surfaces of said tetrahedral figure;

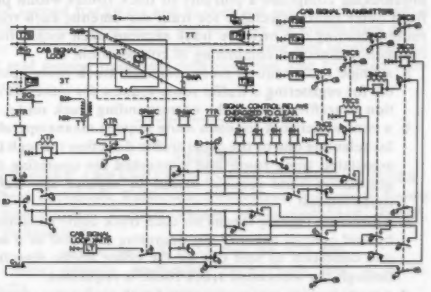
said sail having a substantially diamond shape, having four edges, with a middle portion folded about one of said struts and having first and second sail portions integral with the middle portion and lying on either side of said middle portion and over said pair of surfaces of the tetrahedral figure, said sail including two sheets positioned facewise against each other, substantially in contact over their entire surface and joined together along their edges, one of said struts extending between the sheets along an edge where the sheets are joined together.

3,937,427

CAB SIGNAL CONTROL CIRCUITS FOR RAILROAD INTERLOCKINGS

Kenneth J. Buzzard, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Jan. 24, 1975, Ser. No. 543,696
Int. Cl.² B61L 21/06
U.S. Cl. 246—34 CT 10 Claims



1. A cab signal control arrangement for railroad interlockings comprising in combination,

a. an interlocking control system connected for establishing routes and authorizing train movements through said interlocking,

b. occupancy detection means connected to rails at selected points for individually detecting the train occupancy of prefixed track sections within said interlocking,

c. a plurality of cab signal transmitters coupled to the rails at selected locations within said interlocking and operable when activated for transmitting cab signal control energy through the rails of an associated track section, and

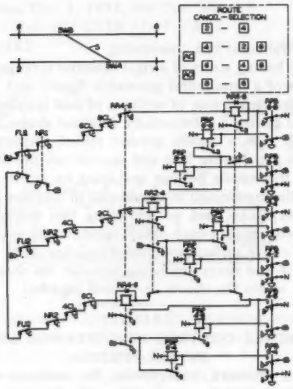
d. a control circuit means coupled to each cab signal transmitter and controlled by said interlocking control control system, by said occupancy detection means, and by other cab signal transmitter control means for selectively activating the associated transmitter only when a train is authorized to traverse an established route, any remaining advance section of the route is unoccupied, any preceding transmitters along the route have been activated, and the train has occupied the corresponding section.

3,937,428

ROUTE INTERLOCKING CONTROL SYSTEM

J. Calvin Elder, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Feb. 6, 1975, Ser. No. 547,702
Int. Cl.² B61L *19/16*
U.S. Cl. 246—34 R 14 Claims



1. A route control system for a railroad interlocking, which interlocking comprises a plurality of track routes within prefixed outer limits selectable for train movements, each track route including one or more track sections each with a train occupancy detector, comprising in combination,

a. a single route request means for each track route operable for registering a traffic route request for either direction of traffic through the corresponding track route,

b. a control network for each route request means operable for selecting one or the other traffic direction through the associated track route and connected for operating the associated route request means to register the traffic route request,

c. a direction registry means for each track route controlled by said control network for operating to a first or a second condition as said one or the other traffic direction through the associated track route is requested,

d. a route locking means associated with each entry point of said interlocking and coupled for locking, when activated any requested traffic route originating at that point, and

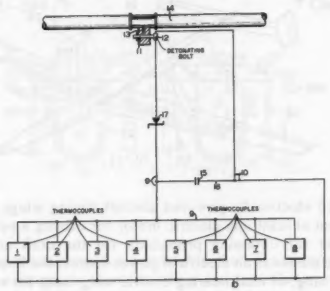
e. an activating circuit network for each route locking means controlled by each associated route request means, the corresponding direction registry means, said occupancy detectors, and opposing route locking means for activating the associated locking means when an originating traffic route request is registered, the corresponding track route sections are unoccupied, and no opposing traffic route is established.

3,937,429

APPARATUS FOR DETECTING HOT JOURNAL BOXES

Jerome R. Pier, Bonita, Calif., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed May 20, 1974, Ser. No. 471,209
Int. Cl.² B61K *9/06*
U.S. Cl. 246—169 A 7 Claims



1. Apparatus for detecting overheated axle journals on a railway car having a brake pipe, said apparatus comprising:

a. an explosive member interposed in and for normally blocking a passageway via which the brake pipe may be vented to atmosphere;

b. a detonating element carried by said explosive member and responsive to an energy charge for effecting explosion of the explosive member;

c. generating means carried by the axle journal and responsive to heat produced by said journal during rotation of the axle for generating an energy charge of a degree commensurate with the degree of prevailing journal heat; and

d. transmitting means for transmitting said energy charge to said detonating element when the energy charge so generated exceeds a certain preselected degree.

3,937,430

METHOD AND APPARATUS FOR CONTROLLING THE SPEED OF A VEHICLE

Thomas H. Engle, Cape Vincent, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Division of Ser. No. 337,990, March 5, 1973, Pat. No. 3,887,239. This application Jan. 23, 1975, Ser. No. 543,202
Int. Cl.² B61B *13/00*
U.S. Cl. 246—182 B 5 Claims

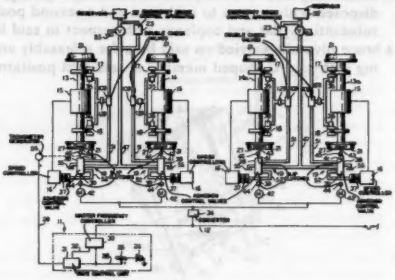
1. A vehicle control system having a motor and brakes for providing tractive power and braking selectively for at least one wheel of a vehicle and apparatus governing the motor and brakes in accordance with sensing desired and actual vehicle speeds wherein the improvement comprises;

a. adhesion control valve means having an input fluid supply port, a first output fluid pressure port for governing brakes of the wheel and a second output fluid pressure port for governing tractive power of the motor,

b. the adhesion control valve means having coaxial input shafts at opposite ends thereof rotated in the same direction in accordance with sensed actual and desired speeds respectively for the wheel of the vehicle,

c. the adhesion control valve means comprising differential sensing means for sensing whether rotation of the desired speed shaft is lagging or leading the actual speed shaft and in accordance therewith for selecting output fluid pres-

sure to be applied to the first or second output ports respectively, and



d. the differential sensing means being operable to deliver an output fluid pressure proportional to the angular velocity difference in rotation of the two input shafts.

3,937,431

POSTIONING APPARATUS FOR TRACKED TRANSPORT VEHICLES WITH LINEAR MOTOR PROPULSION

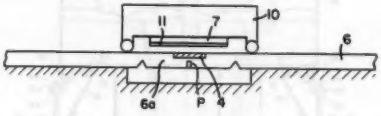
Herwig Güntner, Schwabach, Germany, assignor to Siemens Aktiengesellshaft, Munich, Germany

Filed Sept. 12, 1974, Ser. No. 505,258

Claims priority, application Germany, Sept. 14, 1973, 2346421

Int. Cl.² B61L *3/00*

U.S. Cl. 246—182 B **7 Claims**



1. Positioning apparatus for tracked transport vehicles having a primary alternating current linear motor windings and separate direct current windings located in the vehicle and stationary linear motor parts of a ferromagnetic bar within the position area having a position point therein, said bar having rows of conducting material placed in an orientation perpendicular to the track and spaced a distance from one another as the pole pitch spacing of the primary winding, comprising:

means for sensing the position of the vehicle as it approaches the positioning point from either direction on the track within the position area;

switching control means responsive to said position means for closing one or two switches depending on the position of the vehicle within the position area;

means for measuring the vehicle velocity while said vehicle is within said position area;

excitation control circuit means responsive to said velocity measurement and said switch positions for applying an accelerating, decelerating or zero strength excitation to said primary alternating current linear motor windings if either one or the other of said two switches are closed and for applying a direct current field excitation to said separate direct current windings regardless of said velocity measurement if both of said switches are closed simultaneously.

3,937,432

TRAIN CONTROL

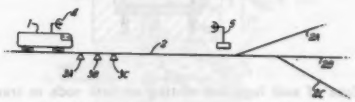
Michael S. Birkin, Derby, England, assignor to British Railways Board, London, England

Filed June 21, 1974, Ser. No. 481,937

Claims priority, application United Kingdom, June 21, 1973, 29572/73

Int. Cl.² B61L *3/02*

U.S. Cl. 246—187 B **9 Claims**



1. A vehicle control system, wherein said vehicle travels along a single, first trackway, defining a first route, which thereafter diverges to form a plurality of second trackways, defining a plurality of alternate routes, comprising; a plurality of transponders or beacons disposed adjacent said first trackway in advance of the point of divergence of said second trackways, equal in number to the number of said second trackways and each adapted to be triggered to emit a signal containing information peculiar to the operating characteristics along one of said second trackways; transmitter means disposed adjacent said second trackways and adapted to emit a plurality of individual signals equal in number to the number of said second trackways and each identifying a particular one of said second trackways; receiver means mounted on said vehicle and adapted to operatively communicate with said transmitter and receive said trackway identifying signals when said vehicle is at a location along said first trackway adjacent said transponders; control equipment mounted on said vehicle, operatively coupled to said receiver to receive the output signal thereof and adapted to operatively communicate with said transponders, when said vehicle is at said location along said first trackway adjacent said transponders, to receive an identifying signal, identifying the one of said second trackways said vehicle is to travel along, from said receiver, to send a triggering signal to the one of said transponders which emits a matching signal and a signal containing information peculiar to the operating characteristics along said identified one of said second trackways and to compare said identifying signal with said matching signal, and to utilize the information peculiar to the operating characteristics along said identified one of said second trackways received from said triggered transponder.

3,937,433

SUPPORT ARRANGEMENTS FOR TURBOMACHINES

Libero Portalconi, Kollbrunn, Switzerland, assignor to Brown Boveri-Sulzer Turbomaschinen Aktiengesellschaft, Zurich, Switzerland

Filed Dec. 20, 1973, Ser. No. 426,480

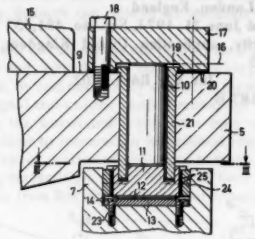
Claims priority, application Switzerland, Jan. 4, 1973, 66/73

Int. Cl.² F16M *13/00*

U.S. Cl. 248—19 **16 Claims**

1. In combination with a turbomachine having a casing split along a horizontal median plane, a lower half of said casing having a plurality of lugs extending therefrom, each lug having an aperture therethrough; a support arrangement for defining the axial position of said lower casing half including vertically extending rods, each rod being disposed within an aperture of

a respective lug and having a coefficient of thermal expansion less than that of said casing and covers secured to an upper



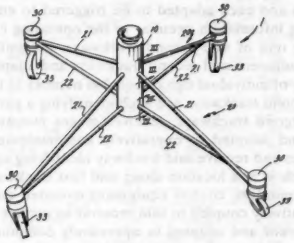
surface of said lugs and resting on said rods to transfer the weight of said turbomachine casing to said rods.

3,937,434

WIRE ROD CHAIR BASE

William H. Tacke, Wyoming, Mich., assignor to Curtis Products Lt., Cobourg, Canada

Filed June 20, 1974, Ser. No. 481,129
Int. Cl.² A47C *7/00*
U.S. Cl. 248—188.7 **10 Claims**



1. A wire rod pedestal type chair base comprising:

a hub assembly; and

a plurality of wire rod support sets supporting said hub assembly, each set including a first rod element attached at one end to and extending laterally and generally horizontally outward from said hub assembly and a second rod element attached at one end to a portion of said assembly above the point at which the first rod is attached and extending diagonally downward therefrom;

a caster socket assembly for each wire rod set secured to the other ends of said first and second wire rods for receiving casters whereby said base rests on the floor; said hub assembly including an inner tube and an outer tube which masks said inner tube, said first rod element extending through and being rigidly attached to said outer tube and said second rod element extending through and being secured to said outer tube, and abutting against said inner tube to provide support.

3,937,435

PAGE HOLDER AND BOOK SUPPORT

Raymond L. Roberts, 1521 Morningside Drive, Burbank, Calif. 91506

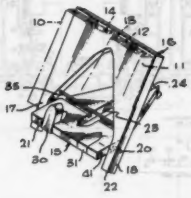
Filed Mar. 21, 1975, Ser. No. 560,706
Int. Cl.² A47B *97/04*
U.S. Cl. 248—464 **9 Claims**

1. A book support and holder for supporting a book in its open condition to separate or divide the pages comprising the combination of:

a base having a predetermined configuration;

a U-shaped member having a cavity corresponding in shape to said base predetermined configuration and being pivotally carried adjacent a selected end of said base so as to rotate between a first position substantially angularly disposed with respect to said base and a second position substantially flat and coplanar with respect to said base;

a brace pivotally carried on said base for releasably engaging with said U-shaped member in said first position;



a pair of tab members pivotally carried along said selected base end and said base provided with a pair of cavities for receiving said tab members when said U-shaped member is in said second position; and

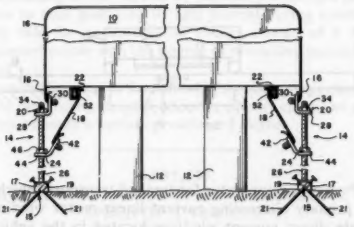
said tab members and said U-shaped member cooperating to support and hold the book and papers open when said U-shaped member is in said first position.

3,937,436

ANCHORING APPARATUS

Ned L. Stewart, 2816 Blue Ridge, Mesquite, Tex. 75149

Division of Ser. No. 298,861, Oct. 19, 1972, Pat. No. 3,830,457. This application Mar. 22, 1974, Ser. No. 454,004
Int. Cl.² E06B *3/54*; E04B *5/52*
U.S. Cl. 248—499 **11 Claims**



1. An apparatus for use in anchoring to the ground an object that is supported above the ground comprising:

two flexible straps engaging and extending from said object;

an anchor body positioned on the ground;

means for attaching said anchor to the ground;

an elongated shaft extending from said anchor body;

two anchorheads axially positioned on said shaft;

means on each of said anchorheads for releasably attaching each of said anchorheads to one of said straps; and

means on said shaft for releasably attaching each of said anchorheads to said shaft and for independently tensioning each of said straps.

3,937,437

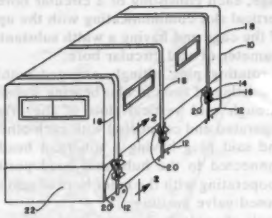
FLUSH MOUNTING DRIVE ANCHOR

Ned L. Stewart, 2816 Blue Ridge, Mesquite, Tex. 75149

Continuation-in-part of Ser. No. 454,004, March 22, 1974. This application Nov. 21, 1974, Ser. No. 525,873
Int. Cl.² E06B *3/54*; E04B *5/52*
U.S. Cl. 248—499 **5 Claims**

1. An anchoring apparatus comprising:

a body portion for embedding in the ground, said body portion comprising a pair of elongated hollow guides for receiving elongated drive anchors therein and a threaded socket provided on the upper portion of said body for positioning said socket flush with the ground surface,



wherein said hollow guides are attached at an angle with respect to each other;

an elongated threaded shaft for releasably engaging said threaded socket; and

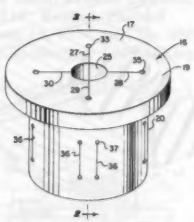
anchorhead means for attaching a strap to said threaded shaft.

3,937,438

FLEXIBLE MOLD WITH HINGED SLITS

Robert H. Fox, Hoffman Estates; Robert J. Henning, Crystal Lake, and Robert F. Morgan, Jr., Winnetka, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Dec. 4, 1974, Ser. No. 529,333
Int. Cl.² B28B 7/06, 7/20
U.S. Cl. 249—117 6 Claims



1. In an integral, flexible, distensible mold having a body portion including a wall defining a shaping cavity therein, the improvement comprising: a closed, openable first slit to said wall, said first slit extending from at least a portion of the wall from the shaping cavity and only partly through the wall portion of the mold; and a second slit in said wall, said second slit extending from at least a portion of the outer surface of body portion and inwardly only partly through the wall of the mold; said first and second slit defining a strip of flexible, distensible material therebetween, the slits including an enlarged marginal portion thereof at the inner edges thereof.

3,937,439

THERMALLY OPERATED VALVE UTILIZING GAS ADSORBENT MATERIAL

Hugh J. Tyler, and Denis G. Wolfe, both of Santa Ana, Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 14, 1973, Ser. No. 415,882
Int. Cl.² F16K 31/165, 17/38; G01K 5/32
U.S. Cl. 251—11 16 Claims

16. A flame responsive valve comprising

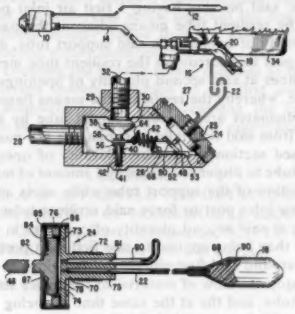
a valve seat,

a flame sensing bulb positioned in the path of a flame,

gas pressure responsive means for moving the valve member relative to the valve seat,

a tube connecting the pressure responsive means to the flame sensing bulb,

a quantity of granular adsorbent material in the flame sensing bulb,



said adsorbent material formed by pyrolytic decomposition of polyvinylidene chloride to form a porous carbonaceous structure with cavities of sufficient size to receive and adsorb monatomic molecules of gas,

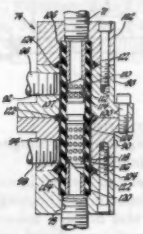
a charge of gas in the flame sensing bulb, tube and gas pressure responsive means, said charge of gas being selected from krypton and xenon.

3,937,440

METERING PUMP AND COMBINATION TWO-SECTION PINCH-OFF ASPIRATOR VALVE

Benjamin N. MacGregor, Flushing, and Arnold I. Wilson, Flint, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 19, 1973, Ser. No. 417,227
Int. Cl.² F16K 31/126
U.S. Cl. 251—61.1 3 Claims



1. A combination two-section pinch-off aspirator valve for dispensing a measured amount of material, said valve comprising: a housing having inlet and outlet openings; a support tube within said housing extending between said inlet and outlet openings; said support tube having a closed section a distance below the inlet opening to divide the support tube into an upper and lower section; said support tube also having a first plurality of openings in spaced relation around said support tube above and below said closed section to connect the upper

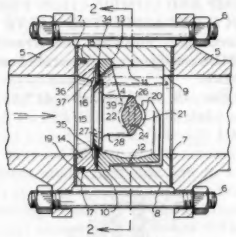
and lower sections of the support tube; said support tube further including a second plurality of openings in the lower section thereof in spaced relation around said support tube a distance below said closed section; said support tube being smaller in diameter in the area of the first and second plurality of openings in said support tube; a resilient tube means positioned about said support tube and cooperating with said support tube defining a passage around the periphery of said support tube closed section and defining a chamber around the periphery of said support tube at said second plurality of openings; said housing having a first air inlet port that surrounds the resilient tube means adjacent the passage at said first plurality of openings in said support tube, and a second air inlet port that surrounds the resilient tube means adjacent the chamber at said second plurality of openings in said support tube, whereby the resilient tube means flexes out of said smaller diameter area in said support tube by air being exhausted from said first inlet port opening the passage around said closed section in the first plurality of openings in said support tube to dispense a measured amount of material to the lower section of the support tube while air is applied to the second air inlet port to force said resilient tube to close the chamber at said second plurality of openings in said support tube, air then being applied to said first inlet port to close the passage around said first plurality of openings in said support tube to stop the flow of material to the lower section of said support tube, and the at the same time air being vented from said second inlet port, whereby the resilient tube moves away from the second plurality of openings in said support tube opening said chamber creating a suction in the lower section of said support tube suctioning material out through said second plurality of openings into said chamber thereby preventing drip from said valve.

3,937,441

ROTARY VALVE

Hans D. Baumann, 29 Villa Drive, Foxboro, Mass. 02035

Filed Feb. 21, 1975, Ser. No. 551,519
Int. Cl.² F16K *1/18*
U.S. Cl. 251—298 **5 Claims**



1. A rotary valve comprising:

a. a tubular housing having a longitudinal central bore extending throughout its length;

b. an inlet and outlet end formed in said housing;

c. a counter bore formed in said housing and extending from the inlet end of said housing towards a stop shoulder, providing at that point a reduced cross-section;

d. a cradle shaped cage assembly removably placed within said housing bore and having a raised diameter portion slidingly engaging the counter bore of said housing and abutting the stop shoulder within said housing;

e. a bore or passage extending throughout the central length of the cradle shaped cage;

f. a ring member guiding closely and being retained by suitable means within said housing and having a central bore defining a valve orifice;

g. one or more sealing rings suitably retained between the terminating face of the raised diameter portion of said cage facing the valve inlet on one side and one terminating surface of the engaged ring member within said housing on the other side and having an inner diameter essentially equal to that of the valve orifice;

h. a pair of openings located perpendicularly to the longitudinal valve axis and within the walls of said cradle shaped cage, each consisting of a circular bore intersected by a vertical slot communicating with the upper open portion of the cage and having a width substantially less than the diameter of said circular bore;

i. a rotating plug tiltingly engaged within said cage and consisting of two circular bearing stubs which slidingly fit through said vertical slots of the cradle shaped cage, separated and connected with each other by a central hub and said plug having a spherical head portion suitably connected to the hub, said head portion engaging and cooperating with the inner bore of said sealingrings in the closed valve position;

j. a pair of guide bushings slidingly engaged over said bearing stubs and within said circular bores located perpendicularly to the longitudinal valve axis within said cage, thereby effectively retaining the rotating plug within the cage;

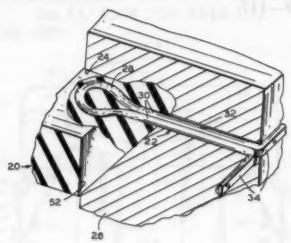
k. means to engage one of said bearing stubs and to tiltingly move the rotating plug.

3,937,442

GATE VALVE HAVING O-RING SEAL

Charles H. Martin, Portland, and Steven V. Brewer, Beaverton, both of Oreg., assignors to Dillingham Corporation, Honolulu, Hawaii

Filed Feb. 27, 1975, Ser. No. 553,586
Int. Cl.² F16K *3/02*
U.S. Cl. 251—328 **11 Claims**



1. In a gate valve,

an annular seat member having a plurality of holes therein spaced therearound,

an O-ring,

and a plurality of fastener members having head portions embedded in the O-ring and also having shank portions extending into the holes and secured to the seat member.

3,937,443

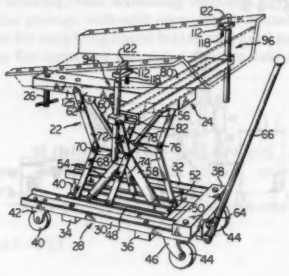
CRANKCASE GUARD JACK UTILIZING DOUBLE PARALLELOGRAM

Virgil Richard Charles Durgan, Tremont, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 11, 1975, Ser. No. 594,975
Int. Cl.² B66F *5/04*
U.S. Cl. 254—10 B **10 Claims**

1. In a jack having a base, a lift head, a pair of parallelogram linkages pivotally mounted on said base and on said lift head, a pair of hydraulic actuators pivotally connected at one end to said base and at the other end to said lift head, said pivoted connections of said actuators to said base and to said lift head being at spaced apart locations, the axis of each ram lying parallel to the plane of the adjacent parallelogram linkage and

crossing each other in spaced apart relationship, pump means for raising said lift head and valve means associated with said pump for lowering said lift head, in combination with a fixture having a box beam mounted at its midportion to one end portion of said lift head and extending perpendicular to the axis of said lift head, support bars projecting from the opposite ends of said box beam, vertically extending telescopic cou-



pling members carried by the outer end portions of said support bars, means on each coupling member for gripping a work load, and a slope adjusting means on said lift head at the end of said head spaced from said fixture whereby said means for gripping the work load may be secured to the edges of the work load and the slope adjusting means is moved into contact with a remote point of said work load prior to lowering said work load.

3,937,444

MIXER

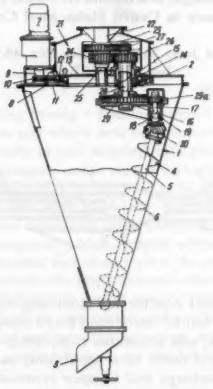
Arno Fritz Ottomar Kapp, Retford, England, assignor to Jenkins of Retford, Ltd., Retford, England

Filed June 17, 1974, Ser. No. 480,270

Claims priority, application United Kingdom, June 19, 1973, 29115/73

Int. Cl.² B01F 7/00

U.S. Cl. 259—40 **5 Claims**



1. In combination with a mixer comprising a mixing receptacle having an axis of symmetry, a top at one end of the axis and an outlet end at an end of the axis opposite to the one end; a conveying screw in the receptacle, the conveying screw being rotatable about its axis and epicyclically, and having an end adjacent the one end of the axis and an opposite end adjacent the opposite axis end for conveying mixed material to the outlet end of the receptacle; and a universal joint coupling the opposite end of the conveying screw to the outlet end of the receptacle; a drive for the conveying screw mounted at the top of the receptacle, the drive including

1. a motor,
2. a first rotary member arranged to be driven by the motor about an axis of rotation,
3. a second rotary member mounted for rotation with an axis of rotation radially spaced from the axis of rotation of the first rotary member,
   a. the second rotary member supporting and rotating the end of the conveying screw adjacent the one axis end at a point radially spaced from the axis of rotation of the second rotary member; and
4. means coupling the second rotary member to the motor to be driven thereby, rotation of the first and second rotary members by the motor causing the conveying screw to be rotated about its axis and epicyclically.

3,937,445

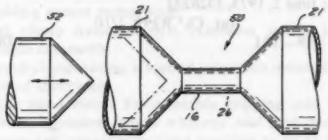
PROCESS AND APPARATUS FOR OBTAINING THE EMULSIFICATION OF NONMISCIBLE LIQUIDS

Vito Agosta, 42 Cherry Lane, Huntington, N.Y. 11743

Filed Feb. 11, 1974, Ser. No. 441,637

Int. Cl.² B01F 5/00, 3/08

U.S. Cl. 259—4 R **12 Claims**



1. A process for obtaining the emulsification of two or more nonmiscible liquids comprising the steps of:

reducing the pressure of at least one of said liquids below its Clausius-Clapeyron pressure;

maintaining said liquid at said reduced pressure for a finite time period until bubbles form; and,

permitting said bubbles to violently contract and expand in the presence of said two or more nonmiscible liquids.

3,937,446

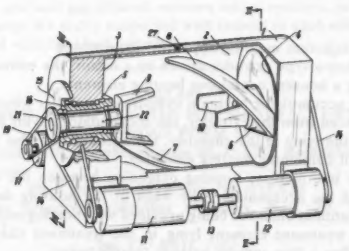
APPARATUS FOR MIXING OF BUILDING MATERIALS

Herbert Feger, Bruchhausen, and Paul Hanss, Reichenbach, both of Germany, assignors to Elba-Werk Maschinen-Gesellschaft mbH & Co., Ettlingen, Baden, Germany

Filed Sept. 30, 1974, Ser. No. 510,741

Int. Cl.² B01F 7/04

U.S. Cl. 259—105 **6 Claims**



1. A concrete mixing apparatus for the mixing of materials including a cylindrical-mixing container having front and rear sides provided with mixing tools comprising:

two carrier arms extending radially outwards from said respective front and rear sides and displaced from each other by 180°;

two elongated helically-shaped mixing tools each supported by a respective one of said carrier arms at one end only of the tool and extending from said respective front and rear sides at an angle towards the center of said mixing container, said helically-shaped mixing tools each having a free unsupported end reaching toward the opposite side but terminating just beyond the center of said container and short of the opposite arm;

two shafts penetrating said respective front and rear sides; and

two rotatable mixing tools disposed ahead of said respective carrier arms on said respective shafts.

3,937,447
INJECTION MOLDING APPARATUS

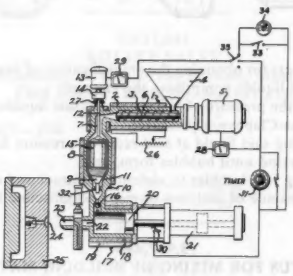
Dieter Alwes; Helmut Eckardt, both of Hilchenbach-Dahlbruch; Hans Peter Leiste, Kirchhundem, and Robert Albert Melcher, Wenden-Gerlingen, all of Germany, assignors to Siemag Siegener Maschinenbau GmbH, Hilchenbach-Dahlbruch, Germany

Filed Sept. 7, 1973, Ser. No. 395,124

Claims priority, application Germany, Dec. 27, 1972, 2263571; June 2, 1973, 2328222

Int. Cl.² B29B 1/10

U.S. Cl. 259—191 **28 Claims**



1. Injection molding apparatus, comprising

a. a screw-type extruder driven by a motor, the extruder having a housing containing heating elements,

b. an accumulator having a cylindrical chamber whose axis is spaced from the extruder, the accumulator having a loading piston lying in the chamber, the accumulator also having a wall containing heating elements,

c. an intermediate housing extending between the extruder and the accumulator, the walls of the housing defining a treatment chamber being provided with heating means, and

d. a treatment element lying in the treatment chamber to define a thin annular passage therebetween,

the end of the treatment chamber and the end of the treatment element adjacent the accumulator being provided with generally pointed surfaces, and the element being axially adjustable in the treatment chamber to accurately determine the thickness of the passage therebetween.

3,937,448
APPARATUS FOR HARDENING STEEL PIPES

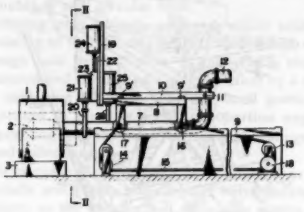
Yoshihisa Fujii, and Akio Fujiwara, both of Wakayama, Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan

Filed May 20, 1974, Ser. No. 471,543

Claims priority, application Japan, May 21, 1973, 48-57585

Int. Cl.² C21D 1/62, 9/14

U.S. Cl. 266—6 S **4 Claims**



1. An apparatus for hardening steel pipes, comprising an inner quenching head mounted for movement in a longitudinal direction of the pipe, an outer quenching head fixedly mounted on a base member, said quenching heads having quenching water jetting orifices inclined at angles of 30° ± 10° to an advancing direction of the pipe axis, a water supply boom fixed to said inner quenching head, means for moving said boom in the longitudinal direction of the pipe, means for holding and centering said inner quenching head along the longitudinal axis of the pipe, said moving means comprising a movable stand and a carriage means for movement parallel to the longitudinal axis of the pipe, said boom being connected to said moving means, and said stand having means thereon for bearing against said boom for moving same in a direction at right angles to the pipe axis.

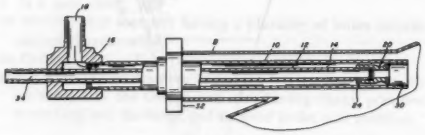
3,937,449
LIQUID-FUEL ATOMIZATION AND INJECTION DEVICE

William F. Copeland, Plum Borough; Charles M. Sciulli, Jr., Whitehall Borough, and Donald G. White, Plum Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 26, 1974, Ser. No. 483,175

Int. Cl.² F27B 1/16

U.S. Cl. 266—29 **6 Claims**



1. A liquid fuel injector for atomizing liquid fuel prior to admixture with hot air introduced into a blast furnace through a hot blast pipe, said apparatus comprising:

a. a cylindrical outer tube penetrating said hot blast pipe with its discharge end in open communication with the interior of said pipe;

b. an inner tube concentrically disposed in said outer tube in spaced relation from the wall thereof;

c. said outer and inner tubes cooperating to define concentric axial and annular passages through said apparatus;

d. a spray nozzle attached to the discharge end of said inner tube and having an outer peripheral edge contiguous with the inner surface of said outer tube to separate said annular passage from said axial passage;

e. said spray nozzle being axially spaced from the discharge end of said outer tube to define a cylindrical atomization chamber adjacent thereto;
f. a cylindrical axial opening through said nozzle connecting said axial passage with said atomization chamber;
g. a plurality of circumferentially spaced atomizing openings through said nozzle in radially spaced relation to said axial opening, said atomizing openings connecting said annular passage with said atomization chamber;
h. means for supplying liquid fuel to said axial passage, and
i. means for supplying atomizing fluid to said annular passage.

3,937,450
SLIDING PISTON GAS SPRING

Fritz Bauer, Schulstr. 14, 8503 Altdorf, near Nurnberg, Germany

Filed Dec. 2, 1974, Ser. No. 528,690
Int. Cl.² F16F 5/00
U.S. Cl. 267—113 6 Claims

1. In a gas spring having a housing formed by a cylindrical tube and a piston rod which acts on compressing piston and is mounted coaxially in said housing, said piston rod supporting a guide and damping piston means with asymmetric damping, said rod protruding from one end of the housing and being provided with a seal, said guide and damping piston means having at least one constantly open damping passageway and at least one passageway which is open when the piston rod travels in one direction and closed when the piston rod travels in the other direction, the improvement wherein:

said guide and damping piston means comprises a sliding piston coaxial with said piston rod and displaceable axially along said rod between two stops, said sliding piston resting in a guiding fashion on the internal wall of said housing, and

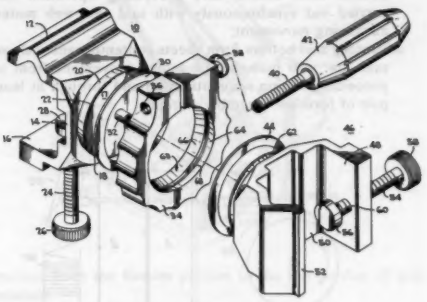
a valve body on said piston rod and maintained from coming off the end of said piston rod, said valve body facing the internal chamber of the housing and serving as one of said two stops for said sliding piston,

said valve body and said sliding piston having complementary corresponding valve seat surfaces, and said passageway open when said piston rod travels in one location and closed when said piston rod travels in said other direction being located in said sliding piston behind its complementary valve seat surface.

3,937,451
HOLDER

Philip J. DiPaola, 258 Wadsworth Ave., New York, N.Y. 10040, and Charles M. Boye, 300 W. 23rd St., New York, N.Y. 10011

Continuation of Ser. No. 390,346, Aug. 22, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,449
Int. Cl.² B25B 5/10
U.S. Cl. 269—45 9 Claims



1. Holding means comprising:

a first clamp having a first extension means integrally formed therewith;

a second clamp having a second extension means integrally formed therewith;

variable sized means for rotatably gripping said first and second extension means whereby said first and second clamps are rotatably secured together so as to be angularly adjustable with respect to one another when said variable sized means is of a first size, and for fixedly gripping said first and second extension means whereby said first and second clamps are fixedly secured together at a selected angular position with respect to one another when said variable sized means is of a second size which is smaller than said first size;

said first and second extensions and said variable sized means being axially aligned;

said first and second extensions being spaced apart from each other by said variable sized means so as to define a gap therebetween when said variable-sized means is either of said first or second size;

a first washer interposed between said variable-sized means and said first clamp;

a second washer interposed between said variable-sized means and said second clamp; and

means for varying said size of said variable sized means

whereby the adjustability of said holding means and said clamps relative to one another is facilitated by said washers and said gap defined between said extensions, yet said clamps are stably supported with respect to each other by said variable sized gripping means.

3,937,452
METHOD AND APPARATUS FOR MANUFACTURING CONTINUOUS FORM SETS

Karl Heinz Gäth, Weinbergstrasse 35, O-3221 Rollinghausen, Germany

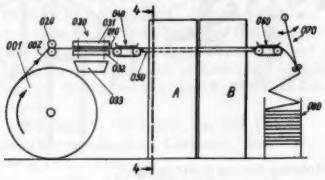
Filed Nov. 26, 1973, Ser. No. 418,934
Claims priority, application Germany, Nov. 29, 1972, 2258431
Int. Cl.² B41L 1/32
U.S. Cl. 270—39 12 Claims

1. A method for making continuous, linearly attached form sets including individual form sheets attached in overlying relationship to a continuous bottom form sheet at spaced intervals along the length of the bottom form sheet, the method comprising:

supplying and advancing a continuous, elongated raw web material to a bottom form sheet processing station with intermittent unidirectional movement, the web material being advanced through said processing station by indexing and advancing means through suitable increments of length corresponding to the desired lengthwise dimension of an individual form set, and being at rest between each intermittent movement;

processing said raw web material to form continuous, joined bottom form sheets, said processing operation being carried out synchronously with said raw web material advancing movement;

advancing said bottom form sheets contemporaneously with said raw web material advancing movement from said processing station sequentially to and through at least a pair of form set assembly stations;



supplying registered overlying pairs of individual form sheets periodically to each of said form set assembly stations;

assembling a first of said pair of individual form set sheets in overlying relationship with said bottom form sheets at a first assembly station while said bottom sheet is at rest at said first assembly station;

assembling a second of said pairs of individual form set sheets in overlying relationship with said first pair of individual form set sheets at a second assembly station while said bottom sheet is at rest at said second assembly station;

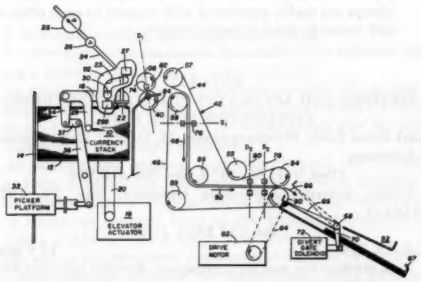
securing said assembled pairs of individual form set sheets to each other and to said bottom sheet to form continuous form sets linearly secured to each other through said joined bottom form sheets.

3,937,453

SINGLE DOCUMENT TRANSPORT

Richard C. Hickey, Plano; Jerry W. Swafford, Dallas; Robert F. Swartzendruber, Plano, and Thomas P. Barnes, Dallas, all of Tex., assignors to Docutel Corporation, Irving, Tex.

Filed Aug. 2, 1974, Ser. No. 494,331
Int. Cl.[2] B65H *3/52, 7/14, 29/62*
U.S. Cl. 271—4 **19 Claims**



1. In a document transport system for transporting documents from a stack to a remote distribution station, comprising in combination:

a pair of separator rollers rotating to transport a document to the distribution station;

means for driving one of said rollers in a direction to transport a document to the distribution station;

means for mounting the second roller of said pair to normally rotate freely in the same direction as said other roller;

means for removing a document from the stack for delivery to said pair of separator rollers;

means at the separator rollers to detect when more than one document moves through said rollers and generate a double detection signal; and

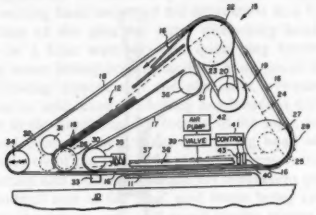
means responsive to said signal to couple the second of said rollers to said means for driving to rotate the rollers of said pair in opposite directions.

3,937,454

SHEET RECIRCULATOR

Richard H. Colwill, 2650 Turk Hill Road, Victor, N.Y. 14564

Filed May 16, 1975, Ser. No. 578,084
Int. Cl.[2] B65H *3/06, 29/12*
U.S. Cl. 271—6 **11 Claims**



1. In apparatus for feeding document sheets in order from a supply stack to the viewing region of a copier and back to said supply stack, the improvement comprising:

a. means arranged above said viewing region for forming a circulation path for said sheets, said path being generally triangular in vertical cross section;

b. means for supporting said supply stack at an incline along a first side of said path;

c. a second side of said path being arranged to extend from the lower region of said first said of said path across said viewing region;

d. a third side of said path being arranged to extend from said second side of said path upward to the upper region of said supply stack;

e. means for successively removing the bottom sheet of said supply stack from said lower region of said supply stack;

f. means for advancing said removed sheets successively in order into said second side of said path;

g. means for synchronizing said advance of said removed sheets with operations of said copier for copying said sheets in said viewing region;

h. means for advancing said copied sheets successively in order from said second side of said path through said third side of said path;

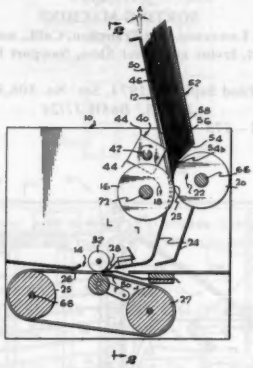
i. means for advancing said copied sheets successively in order to superposed relation over the top sheet of said supply stack; and

j. said means for advancing said removed sheets and said copied sheets comprises a pair of endless belts, drive means for said endless belts, and outer one of said belts is substantially transparent, an inner one of said belts is substantially opaque, said inner belt passes under said supply stack, said outer belt passes over said supply stack, and said belts travel together through said second and third sides of said path.

3,937,455
AUTOMATIC STACK FEED

Frank W. Hauser, Santa Monica, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Apr. 1, 1974, Ser. No. 456,789
Int. Cl.² B65H *3/06*
U.S. Cl. 271—10 **2 Claims**



1. Apparatus for feeding individual sheets from a stack comprising:

a hopper having a lower side plate (**50**) extending at an angle of at least a few degrees and less than 45° from the vertical and having a slot near its lower end, said hopper having an upper plate with a lower end (**54**) which extends towards said lower plate but which has an end (**54*b***) spaced therefrom to form a throat (**56**) at the bottom of the hopper through which only a portion of the sheets of a full hopper can pass;

feed roller means (**16**) positioned below said throat and activatable to move individual sheets along a predetermined feed path leading from said hopper means;

a prefeed member (**40**) with at least one projection, said prefeed member being rotatably mounted with its projection passing through said slot in said lower side plate to beat against a bottom sheet in the hopper;

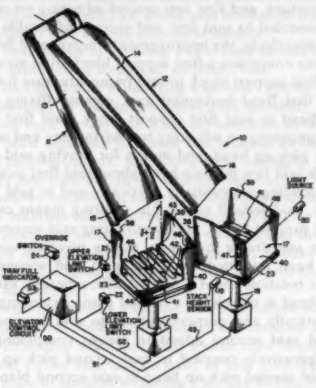
said prefeed member located immediately above said throat (**56**) to lie substantially opposite said lower end (**54**) of the upper plate, whereby the prefeed member tends to bend primarily the few sheets that have passed through the throat rather than uniformly bending the entire stack of sheets.

3,937,456
ARTICLE STACKING APPARATUS

Romualdas K. Gruodis, Mt. Airy, Md., and Eugene D. Milbradt, Annandale, Va., assignors to Fairchild Industries, Inc., Germantown, Md.

Filed Sept. 26, 1974, Ser. No. 509,724
Int. Cl.² B65H *29/26, 31/08*
U.S. Cl. 271—64 **4 Claims**

2. Article stacking apparatus comprising means for impacting with moving articles which are to be stacked, said impact means having an inclined surface with a lower end portion and means located adjacent to the lower end portion of said slide surface for receiving articles which have impacted with said impacting means, said article receiving means comprising a container with a bottom portion and an open top portion, said container having an inclined inner bottom surface inclined downward substantially toward one inner corner of said container and having at least two sides which slope in an outward

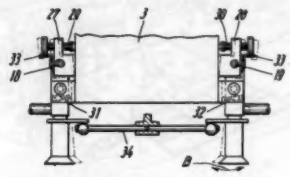


direction from the bottom portion to the top portion of said container.

3,937,457
SHEET FEEDER APPARATUS

Adolf Schwebel, Offenbach am Main, Germany, assignor to Mabeg Maschinenbau GmbH and Nachfolger Hense & Pleines GmbH & Co., both of Offenbach, Germany

Filed Aug. 19, 1974, Ser. No. 498,597
Claims priority, application Germany, May 14, 1974, 2423349
Int. Cl.² B65H *3/02*
U.S. Cl. 271—92 **14 Claims**



1. In a sheet feeder apparatus for transferring sheets in a transport direction, said feeder apparatus having a frame structure, sheet pick-up means including at least one pick-up head, means for adjustably securing said sheet pick-up means to said frame structure, and adjusting means operatively connected to said adjustable securing means, the improvement wherein said adjustable securing means comprise a support block, first means pivoting said support block to said frame structure for rotation about a first fixed horizontal axis extending transversely of the transport direction, further means pivoting said pick-up head intermediate its ends to said support block for rotation about a second axis extending in a plane normal to said first axis, said adjusting means comprising an adjusting rod having a threaded end and an opposite end, said opposite end being secured to an upper end of said pick-up head, guide means secured to said frame structure, said adjusting rod extending through said guide means with said threaded end extending out of said guide means, an adjusting nut on said threaded end of said adjusting rod, and spring means on said adjusting rod urging said upper end of said pick-up head away from said guide means and thus the adjusting nut against the guide means.

8. In a sheet feeder apparatus for transferring sheets in a transport direction, said sheet feeder apparatus having a frame

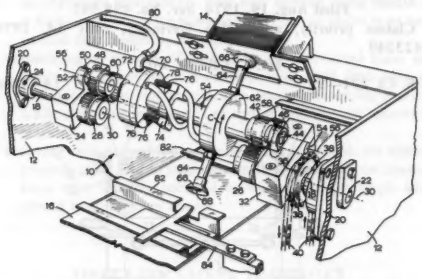
structure, sheet pick-up means including first and second pick-up heads, first and second means for adjustably securing said first and second sheet pick-up means respectively to said frame structure, and first and second adjusting means operatively connected to said first and second adjustable securing means respectively; the improvement wherein said first adjustable means comprises a first support block, first means pivoting said first support block to said frame structure for rotation about a first fixed horizontal axis, means affixing said first pick-up head to said first support block, said first adjusting means comprising an adjusting rod having one end secured to said first pick-up head, and means for moving said adjusting rod to tilt said first pick-up head about said first axis in a first plane extending substantially vertically and in said transport direction, said second adjustable securing means comprising a second support block, means mounting said second support block on said frame structure, means pivoting said second pick-up head intermediate its ends to said second support block for rotation about a second axis, whereby said second pick-up head is tiltable in a second plane extending substantially vertically and perpendicularly to said transport direction, and said second adjusting means comprising control means operatively coupled to said second pick-up head for tilting said second pick-up head in said second plane.

3,937,458

ROTARY TRANSFER MECHANISM

Marinus J. M. Langen, Rexdale, Canada, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Filed June 3, 1974, Ser. No. 475,444
Int. Cl.² B65H *3/08, 3/05*
U.S. Cl. 271—95 **1 Claim**



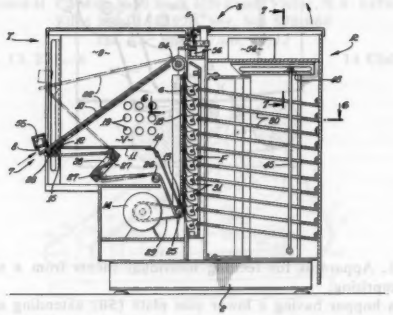
1. A rotary transfer mechanism for transferring items from a dispenser station to a receiver station which is circumferentially spaced 120° in a first angular direction from the dispenser station in an arc generated about a central axis, the transfer mechanism comprising; a frame having a carriage member mounted for rotation thereon about said central axis, a stationary gear mounted on the frame in axial alignment with said central axis and disposed adjacent said carriage, idler gear means mounted for free rotation on said carriage in meshed engagement with said stationary gear means for rotation about said stationary gear means in response to rotation of said carriage about said central axis, third gear means mounted on said carriage in meshed engagement with said idler gear means to be rotatably driven by said idler gear means about a second axis in response to rotation of said carriage about said central axis, a transfer head means mounted on said carriage for rotation about said second axis with said third gear means, said transfer head means including, a pair of diametrically opposed pick-off arms projecting radially from said second axis, each of said pick-off arms having a pick-off head at the radially outer end thereof, drive means for rotatably driving the carriage about said central axis in a direction opposite to said first angular direction, the radial distance from the pick-off heads to the second axis being twice the pitch center distance between the stationary gear and the third gear, whereby rotation of said carriage about said central axis as aforesaid in the direction opposite to said first angular direction causes movement of said pick-off head in said first angular direction along an arcuate path which extends between said dispenser station and said receiver station, said arcuate path having a concave curvature in the direction towards said second axis such that the article which is transferred is rotated upon itself through an arc of no more than 120°.

3,937,459

SORTING MACHINE

Frederick J. Lawrence, San Francisco, Calif., assignor to Keith B. Stewart, Irvine and Peter Shea, Newport Beach, both of, Calif.

Filed Sept. 16, 1974, Ser. No. 506,526
Int. Cl.² B65H *31/24*
U.S. Cl. 271—173 **18 Claims**



1. In a sorting machine having walls defining a vacuum chamber, sheet carrying belts movable about said chamber, and receiver means for successively receiving the sheets from said belts in sorted relation, the improvement wherein said walls and belts have portions pivotal about a horizontal axis and provide a vacuum adjustable sheet input section about which said belts move, whereby said machine is adapted to receive sheets from a source of selected height.

3,937,460

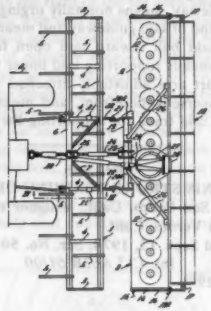
COMBINATIONS OF TWO SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Apr. 24, 1974, Ser. No. 463,590
Claims priority, application Netherlands, May 1, 1973, 7306002
Int. Cl.² A01B *33/00*
U.S. Cl. 172—59 **13 Claims**

1. A soil-cultivating assembly comprising a combination of two cultivating implements positioned one behind the other, each of said implements having a frame and a coupling member for independent and alternative connection to one another and to a prime mover, a first implement being positioned as a leading implement and having tines rigidly fixed to a corresponding frame and a second implement having rotatable soil-working tined members that revolve about upwardly extending axes, driving means for revolving said soil-working members and said driving means being in driving engagement with a power take-off of the prime mover, the coupling members of said two implements being interconnected with a three-point lifting device of the prime mover, the front of the frame of said leading implement having its corresponding coupling member positioned for connection to the three-point lifting device of the prime mover, arm means being provided, between the rear of said coupling member and the coupling

member of the said second implement for linking said respective coupling members, said arm means comprising upper arm



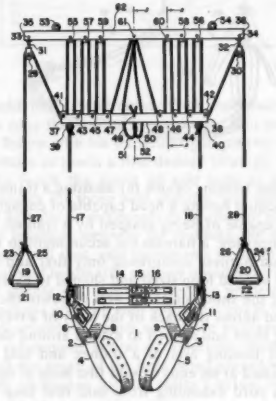
means and lower arm means, stop means being positioned adjacent said lower arm means to limit movements of same.

3,937,461

EXERCISER FOR AERIAL CALISTHENICS

Hyok Sang Lew, 17776 W. 14th Ave., No. 2, Golden, Colo. 80401

Filed Dec. 26, 1973, Ser. No. 427,804
Int. Cl.[2] A63B 7/02
U.S. Cl. 272—60 R 6 Claims



1. A hoist usable for lifting and suspending an exercising person in midair in doing aerial exercises, said hoist comprising:

a. a first elongated structural member having a cross section of a channel, said first structural member including:

1. a first pulley suspended from one extremiety of said first structural member;
2. a second pulley suspended from the other extremity of said first structural member; and
3. a plurality of sheaves disposed within the channel of said first structural member in series and rotatably secured to said first structural member; whereby, said sheaves are rotatable about axis normal to the channel walls of said first structural member;

b. a second elongated structural member having a cross section of a channel, said second structural member having a length shorter than the length of said first structural member, said second structural member including;

1. a plurality of sheaves disposed within the groove of said second structural member in series and rotatably secured to said second structural member; whereby, said sheaves are rotatable about axis normal to the channel walls of said second structural member;
2. a first means of securing a first rope to one extremity of said second structural member; and
3. a second means of securing a second rope to the other extremity of said second structural member;

c. a third rope having a first handle attached to one end of said third rope and the other end secured to one of said structural members, said third rope engaging said first pulley and various pairs of said sheaves, each of said pairs of sheaves including a sheave belonging to said first structural member and another sheave belonging to said second structural member; whereby, pull of said first handle moves said pair of structural members toward one another with a force greater than said pull exerted on said first handle; and

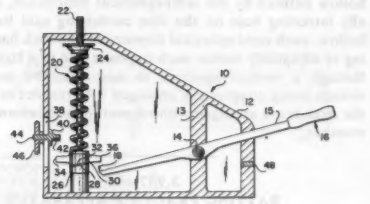
d. a fourth rope having a second handle attached to one end of said fourth rope and the other end secured to one of said structural members, said fourth rope engaging said second pulley and various pairs of said sheaves, each of said pairs of sheaves including a sheave belonging to said first structural member and another sheave belonging to said second structural member; whereby, pull of said second handle moves said pair of structural members toward one another with a force greater than said pull exerted on said second handle.

3,937,462

EXERCISING DEVICE

Kasimir Kusmer, 1021 Cochran St., Aurora, Ill. 60506

Filed Aug. 15, 1974, Ser. No. 497,714
Int. Cl.[2] A63B 21/00
U.S. Cl. 272—83 R 22 Claims



1. An exercising and development apparatus for use with the limbs of an operator employing the principle of isotonic exercise combined with the principle of isometric impact exercise, comprising:

a force resisting means

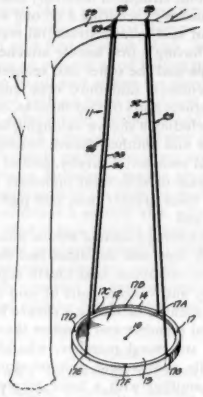
a lever for operating against said force resisting means, said force resisting means having a resistance selected such that the amount of force necessary to be applied to said lever by the operator thereof to overcome said resistance provides the limbs of the operator with isotonic exercise;

means for adjusting the force of said force resisting means;

means for releasing said lever from said force resisting means, and

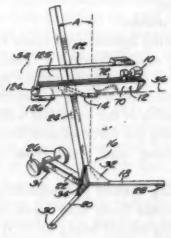
a travel restricting means for impeding the travel of said lever upon release from said force resisting means, said travel restricting means being located with respect to said lever so as to permit said lever to travel rapidly upon release of said force resisting means therefrom and so as to apply to the limbs of the operator isometric impact exercise when said lever strikes said travel restricting means.

3,937,463
CONGRUENT SUSPENSION TWIST SWING
Donald R. Soisson, 1160 Bresee Ave., Pasadena, Calif. 91104
Filed Sept. 24, 1974, Ser. No. 508,816
Int. Cl.² A63G 9/00
U.S. Cl. 272—85 4 Claims



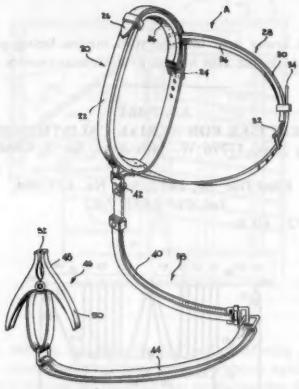
1. A swing to be supported from a horizontal support member for both arcuate and rotational motion and comprising a rider support disc, a peripheral rim on the disc, said rim having top and bottom walls, a plurality of substantially vertical apertures extending through said walls of said rim of said disc, a plurality of support strands, means for fixing the strands at spaced positions about the horizontal support member, a semi-spherical depression in said bottom wall of the disc adjacent each vertical aperture in said wall, a lock bar across the hollow defined by the semi-spherical depression, and a radially intruding boss on the disc containing said bar and said hollow, each semi-spherical depression and lock bar cooperating to adjustably secure each opposite end of a strand passing through a vertical aperture to said disc, the ends of said strands being congruently arranged with respect to the disc as the strands are arranged with respect to the horizontal support member.

3,937,464
BATTING PRACTICE APPARATUS
Casimir Zalewski, 19835 W. Pheasant Run Drive, New Berlin, Wis. 53151
Filed June 19, 1974, Ser. No. 480,778
Int. Cl.² A63B 69/40
U.S. Cl. 273—26 R 15 Claims



1. Batting practice apparatus comprising a linear track, means supporting said linear track, a rail spaced laterally of said track and extending parallel thereto, said track and rail comprising means forming a bat receiving guideway open at its front end through which a bat may be swung, a ball, means slidably supporting said ball for movement along said track within said guideway, means normally urging said ball toward the open front end of said guideway and means for limiting the movement of said ball toward said open front end of said guideway, said means supporting said linear track comprising a post, a support arm adjustably attached to said post and extending transversely therefrom, and means attaching said support arm to said track for supporting the same.

3,937,465
TENNIS STROKE TRAINING DEVICE
Bruce Roland, San Pedro, Calif., assignor to Rolson & Co., Rancho Palos Verdes, Calif.
Filed Sept. 13, 1974, Ser. No. 505,558
Int. Cl.² A63B 61/00
U.S. Cl. 273—29 A 11 Claims

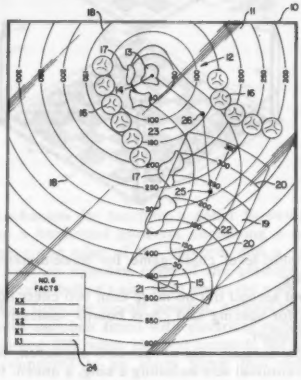


1. A tennis training device for assisting a trainee in stroking a tennis racquet having a head capable of engaging a ball and a handle capable of being grasped by a trainee; said training device comprising: a harness for securement to the body of a trainee, said harness comprising only first and second body loops, said second loop sized and shaped to extend across the chest, over the shoulder of the arm opposite the racket holding arm and across the back of the body of a trainee; said first loop being sized and shaped to extend around the shoulder of said racket holding arm of a trainee and said second loop being attached at its ends to said first loop at opposite points thereon; a cord extending from said first loop towards said racket, an attachment means on one end of said cord to secure said cord to a tennis racket at a point intermediate the portion of a head engaging a ball and the portion of the handle grasped by a trainee.

3,937,466
METHOD FOR PLAYING STRATEGY GOLF
James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429
Continuation of Ser. No. 406,643, Oct. 15, 1973, abandoned, which is a continuation of Ser. No. 220,045, Jan. 24, 1972, abandoned. This application Feb. 18, 1975, Ser. No. 550,476. The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.
Int. Cl.² A63B 57/00, 69/36
U.S. Cl. 273—32 R 5 Claims

1. A method of playing strategy golf actually or vicariously comprising the steps of using a sheet member having uniformally spaced apart increments of distance thereon extending away from a readily discernible location thereon in sufficient

directions from said discernible location that said sheet member can readily accommodate proportionally accurate layouts of the widely varying holes played by golfers, including holes having a dogleg to the right of the tee area and a dogleg to the left of the tee area with said increments of distance extending to said tee area, and laying out, on said sheet member and over said increments of distance thereon, the characteristics of a particular hole to be played actually or vicariously by the golfer by disposing means on said sheet member at said readily discernible location to represent the golf green of said hole, disposing means on said sheet member at the appropriate distance from said readily discernible location to represent the golf tee area of said hole, disposing means on said sheet member between said tee area representation and said green representation to represent the locations of the landmarks and hazards of said hole that could be encountered by the golfer



in playing said hole, determining from said laid out sheet member or a copy thereof the first strategic shot path that the golfer could follow with his particular golf playing abilities or vicarious abilities to reach a first desired strategic location in attempting to reach the green of said hole in a minimum number of strokes for those said abilities, and playing a first golf ball shot actually or vicariously in an attempt to reach said first strategic location, whereby on reaching the area of said first played golf ball shot, said increments of distance and the relationship of said landmarks and any noted hazards yet to be encountered enable said golfer to readily predetermine any additional strategic golf ball shot paths that could be followed actually or vicariously to reach successive strategic locations from which subsequent actual or vicarious shots could be taken to reach the green of the hole being played with a minimum member of strokes for the golfer's actual or vicarious ability.

3,937,467

BILLIARD BALL

Richard W. Benson, Delmar; John R. Crnak, Mechanicville, and Richard G. Ingraham, Delmar, all of N.Y., assignors to Albany International Corporation, Albany, N.Y.

Continuation of Ser. No. 412,965, Nov. 5, 1973. This application Mar. 10, 1975, Ser. No. 556,621

Int. Cl.[2] A63B *37/00*

U.S. Cl. 273—59 R **5 Claims**

1. A billiard ball comprising: a major portion formed of a thermosetting plastic and a minor portion of thermosetting plastic together forming a solid spherical body; said minor portion comprising a bracelet having surfaces thereon defining a mechanical interlock adapted to cooperate with associated surfaces of said major portion in forming a mechanical bond between said major and minor portions, said bracelet having an outer surface, a substantially flat inner surface, a pair of opposed circular openings extending through the bracelet perpendicular to the bracelet axis, each of said openings extending on opposite sides of a diameter of said ball from said inner surface toward said outer surface to a first position and then flaring out at a taper from said first position to said outer surface, a pair of sides connecting said inner and outer

surfaces, a pair of recesses intermediate said inner and outer surfaces formed by a pair of diametrically opposed surfaces extending toward each other from said sides, and said interlock comprises two surfaces extending between said opposed surfaces and said flat surface inclined toward each other and converging away from the center of the ball.

3,937,468

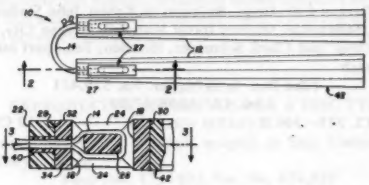
HANDLE FOR A NUNCHAKU DEVICE

Francis E. Conde, Sr., 435 Lancaster Ave., Lancaster, Pa. 17603

Filed Feb. 24, 1975, Ser. No. 552,661

Int. Cl.[2] A63B *59/00*

U.S. Cl. 273—84 **5 Claims**



1. A handle member a nunchaku, said handle member comprising:

an insert having first and second end surfaces, opposed exterior sidewalls extending between said opposed end surfaces, opposed interior sidewalls extending between said opposed end surfaces and said opposed exterior sidewalls, and a tubular portion which extends away from said first end surface, said insert further being provided with a pair of generally parallel spaced apart apertures extending through said insert from one of the exterior sidewalls to the other exterior sidewall; and

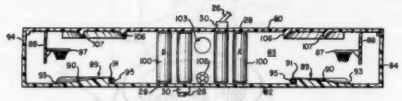
an elongated generally cylindrical principal body portion molded about said insert and extending away from the second end surface of said insert, said principal body portion being formed of a plastic having a lower melt temperature than said insert, the parts being so arranged and constructed that the exterior sidewalls of said insert and the end of the tubular portion remote from the first end surface of the insert are exposed.

3,937,469

GAMES USING MAGNETICALLY ACTUATED MEMBERS

Samuel W. Cohen, 4001 Beach 44th St., Brooklyn, N.Y. 11224

Filed June 6, 1974, Ser. No. 476,773
Int. Cl.[2] A63F 7/06
U.S. Cl. 273—85 F 6 Claims



1. A basketball game comprising

a game board formed of upper and lower plates, means for holding said plates in a spaced relationship to define a game area therebetween,

means in said game area defining a simulated basketball court, said means including a basket at each end of said court which is raised from the surface of the bottom plate,

a plurality of team members disposed within said game area,

actuator means disposed and movable over the outer surface of one of said plates, mutually magnetic attractive means on said actuator means and on said team members so that said team members are moved and carried along as the actuator means is moved,

a ball of resilient material,

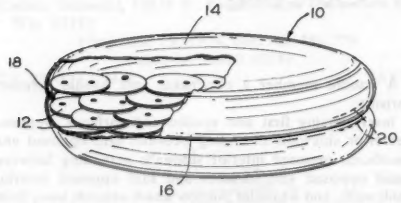
a projection extending upwardly from said bottom plate in front of each basket for engagement by the ball as it is moved by being hit by a moving team member under the control of said actuator means, and resilient means adjacent said upwardly extending projection to further assist in projecting the ball upwardly toward the basket when it hits the projection.

3,937,470

GAME FOOTBAG

Robert John Stalberger, Jr., and Michael David Marshall, both of Oregon City, Oreg., assignors to Robert John Stalberger, Jr., Milwaukie; Michael David Marshall, Oregon City, both of Oreg. and Clark Schneider, Houston, Tex., part interest to each

Filed Dec. 4, 1974, Ser. No. 529,451
Int. Cl.[2] A63B 67/00
U.S. Cl. 273—106 R 10 Claims



1. In a partially collapsible footbag,

a hollow, flexible cover normally in the general shape of a flattened sphere of a predetermined diameter,

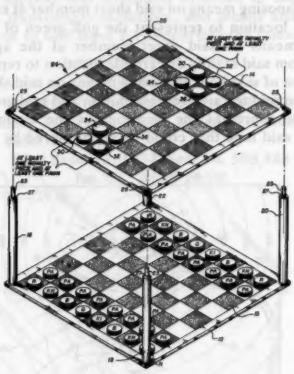
and filler material at least primarily of a multitude of hard, smooth, small discs of a diameter or diameters no greater than a small fraction of the diameter of the flattened sphere and lying generally parallel to each other and parallel to the flat sides of the cover, the discs being slidable relative to each other and the cover and only partially filling the cover.

3,937,471

MULTIPLE-BOARD CHESS GAME WITH ADDITIONAL CHESSMEN

Gerald R. Brennan, 1012-112th SE., Seattle, Wash. 98004

Filed Aug. 5, 1974, Ser. No. 494,730
Int. Cl.[2] A63F 3/02
U.S. Cl. 273—131 AC 11 Claims



1. A multi-level chess game for three-dimensional play, comprising:

first and second but no more than two chess boards;

means for spacing said chess boards vertically away from each other;

two conventional sets of standard chessmen, each of said conventional sets including a king, a queen, two knights, two bishops, two rooks, and eight pawns, each of said conventional sets being initially positioned in standard fashion on said first chess board; and

two additional sets of standard chessmen, each of said additional sets consisting of:

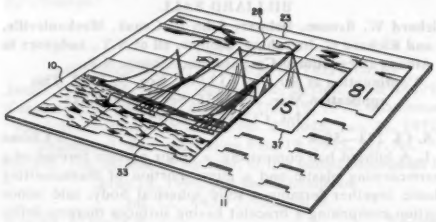
1. at least one additional royalty piece, chosen from the group consisting of: queen, bishop, rook and knight; and
2. a minimum of one additional pawn and at least as many additional pawns as there are queen and rook royalty pieces in each of said additional sets, each of said additional sets being initially positioned on said second chess board.

3,937,472

EDUCATIONAL AND AMUSEMENT PUZZLE

David W. Rice, 3728 Boomer Road, Cincinnati, Ohio 45239

Filed June 9, 1975, Ser. No. 584,896
Int. Cl.[2] A63F 9/10
U.S. Cl. 273—157 R 15 Claims



1. A puzzle comprising a plurality of cards adapted to be arranged in a predetermined pattern in the completed form of a puzzle, location means on each of said cards providing for

the disposition of said cards in said predetermined pattern in properly located positions of said cards, said cards being overlapped in said located positions thereof so that the combined exposed portions thereof form a picture, the non-exposed overlapped portions of the cards including information useable as a guide in the assembly of the puzzle.

3,937,473

GOLF SWING TRAINING DEVICE

Alvi R. Blasi, Daly City, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 6, 1975, Ser. No. 539,009
Int. Cl.² A63B *69/36*
U.S. Cl. 273—183 B **2 Claims**

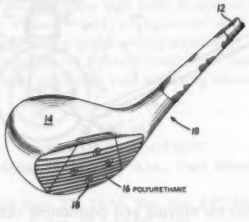
1. A mechanism for teaching a golfer to swing properly comprising a horizontal platform containing a golf tee-off position near one edge of the platform and a vertical rod mounted near an opposed edge of the platform, said rod joining a circular belt of a size to fit about the waist of a golfer driving a ball from the tee-off position, without touching said golfer's waist said belt fitted with electrical switches one of which is turned ON when the belt contacts the golfer, said switches connected to an alarm signal that indicates the contact.

3,937,474

GOLF CLUB WITH POLYURETHANE INSERT

John W. Jepson, Marion, and Earle F. Allen, Jr., Dartmouth, both of Mass., assignors to Acushnet Company, New Bedford, Mass.

Continuation of Ser. No. 122,753, March 10, 1971, abandoned. This application Feb. 25, 1974, Ser. No. 445,462
Int. Cl.² A63B *53/04*
U.S. Cl. 273—173 **1 Claim**



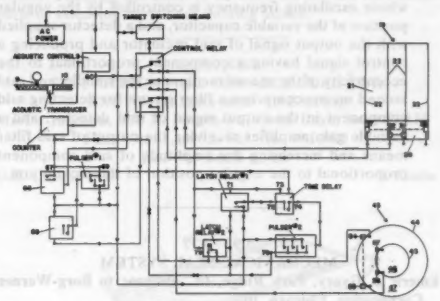
1. In a golf club comprising a shaft and a club head, the improvement which comprises a polyurethane striking plate of about ¼ inch thickness and a hardness of from about 40 to about 75 on the Shore Durometer D Scale according to ASTM Standard D 2240 affixed to the striking face of the club head, said polyurethane being a cured reaction product of components consisting essentially of a prepolymer consisting essentially of a polytetramethylene ether glycol combined with toluene diisocyanate and having about 9.5% free isocyanate, and a curing agent for the prepolymer selected from the group consisting of tetrafunctional polyols and 4,4′-methylene-bis-2-chloroaniline, and wherein the prepolymer and the curing agent are in an equivalent weight ratio of about 1:1 for the tetrafunctional polyols and about 1.2:1 for the 4,4′-methylene-bis-2-chloroaniline.

3,937,475

GOLF GAME

Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y. 12308

Division of Ser. No. 204,890, Dec. 6, 1971, Pat. No. 3,784,207. This application Sept. 28, 1973, Ser. No. 401,638
Int. Cl.² A63B *67/02, 69/36*
U.S. Cl. 273—176 FA **10 Claims**



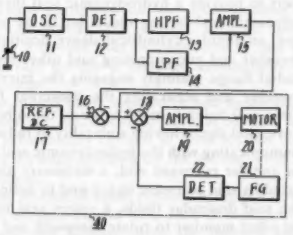
1. A golf game apparatus, comprising a golfing lane having a golf ball tee disposed at one end from which golf balls are hit, ball halting means disposed at the opposite end for halting balls propelled from said tee, and accuracy determining and indicating means functionally associated with said tee and said ball halting means for automatically displaying a numerical accuracy representation for each ball hit from said tee; said accuracy determining and indicating means include pulsing means for providing a preset number of pulses representative of which area of said halting means is hit, and a remotely interconnected numeric indicating device operative in receiving and translating said pulses to provide a numeric display of said accuracy representation.

3,937,476

REPRODUCING APPARATUS FOR A DISC TYPE RECORD MEDIUM

Masaaki Sakai, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Dec. 17, 1973, Ser. No. 424,929
Claims priority, application Japan, Dec. 28, 1972, 48-1723
Int. Cl.² G11B *17/00, 3/60;* H02K *27/20;* H02P *7/00*
U.S. Cl. 274—39 A **9 Claims**



1. In a reproducing apparatus for a disc type record medium having a pickup arm, a rotary shaft rotatably supported and said pickup arm mounted thereon, and a turntable having a

spindle adapted to rotate a disc type record medium which is scanned by a pickup on said pickup arm, comprising:

a. first means producing an output signal proportional to the instantaneous angular position of the pickup arm, the output signal including a component proportional to the eccentricity of the record medium or the spindle;

b. second means receiving the output of said first means and detecting said component proportional only to the eccentricity of the record medium or the spindle and producing an output signal proportional thereto;

c. third means for controlling the rotational speed of the turntable in response to the output signal of the second means, and wherein said first means comprises a variable capacitor associated with said rotary shaft, an oscillator whose oscillating frequency is controlled by the angular position of the variable capacitor, and a detector supplied with the output signal of said oscillator and producing a control signal having a component proportional to the eccentricity of the record medium or the spindle; and said second means comprises a filter circuit for detecting said component in the output signal of said detector, and a variable gain amplifier receiving the output of said filter means and increasing the amplitude of said component proportional to the angular position of the pickup arm.

3,937,477

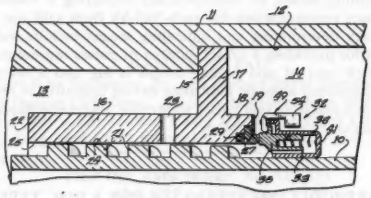
MECHANICAL SEAL SYSTEM

Emeric J. Gyory, Park Ridge, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 26, 1973, Ser. No. 428,164

Int. Cl.² F16J 15/16

U.S. Cl. 277—25 **11 Claims**



1. A sealing device for use between a pair of relatively rotating members, one of said members having an opening extending therethrough and receiving said other member therein, comprising a viscous shear pump defined between said members to provide a hydrodynamic seal therebetween, said hydrodynamic seal having dissimilar fluids on opposite sides thereof, an annular cylindrical sleeve positioned within said one member and encompassing said other member and having a radial flange sealingly engaging the interior wall of the one member and separating the dissimilar fluids, said hydrodynamic seal being formed between the other member and the sleeve, said sleeve having a plurality of radial openings therein communicating with the hydrodynamic seal and terminates in an annular rearward end, a stationary annular face ring supported by said rearward sleeve end to define a boundary between said dissimilar fluids, a rotary seal ring encompassing said other member to rotate therewith and reciprocable axially relative thereto toward and away from sealing contact with said face ring, resilient means yieldably urging said rotary seal ring against said face ring, and means operative upon relative rotation of said members to urge said rotary seal ring away from said stationary face ring.

3,937,478

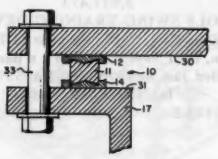
COINING SEAL

Lloyd Mancebo, 856 Adams Ave., Livermore, Calif. 94550

Filed Nov. 18, 1974, Ser. No. 524,843

Int. Cl.² F16J 9/00

U.S. Cl. 277—171 **6 Claims**



1. A bakeable high pressure-vacuum seal to be compressed between two planar surfaces comprising

a first generally inductile sealing element having a first sealing surface defining a first pair of protruding sharp edges and a second sealing surface defining a second pair of protruding sharp edges,

a second generally ductile sealing element adapted to match the shape of said first sealing element and be compressed against said first sealing surface engaging both sharp edges of said first pair of protruding sharp edges, and

a third generally ductile sealing element adapted to match the shape of said first sealing element and be compressed against said second sealing surface engaging both sharp edges of said second pair of protruding sharp edges,

a second and third sealing elements being disposed between said two planar surfaces and compressed together thereby.

3,937,479

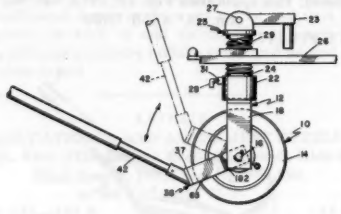
DOLLY FOR MOVING AND POSITIONING VEHICLES

Virgil D. Dalton, 2311 Bergener, San Diego, Calif. 92110

Continuation-in-part of Ser. No. 239,557, March 30, 1972, abandoned. This application July 25, 1973, Ser. No. 382,509

Int. Cl.² B60K 27/00

U.S. Cl. 280—3 **10 Claims**



1. Apparatus for moving and positioning vehicles comprising:

frame means for attachment to a vehicle,

said frame means having an axle with a wheel rotatably mounted thereon,

a drive disc fixed to said wheel,

a U-shaped yoke with ends rotatably secured to said axle on opposite sides of said wheel, said yoke enclosing said wheel and drive disc,

handle means secured to said yoke at a connection located outside the circumference of said wheel for rotating said yoke,

drive pawl means on said yoke for selectively engaging said drive disc,

drive pawl selector means for resiliently positioning said drive pawl means to engage the said drive disc on alternate strokes of said yoke by said handle,

holding pawl means on said frame for selectively engaging said drive disc,

holding pawl selector means for positioning said holding pawl means to engage said drive disc and prevent rotation of said drive disc in one selected direction relative to said frame,

said drive and holding selector means respectively including means for positioning said drive and holding pawl means so that they do not engage said drive disc and thereby do not interfere with the free rotation of said wheel,

each of said pawl selector means including pawl biasing means for resiliently biasing said pawls into engagement with said drive disc,

and brake means for restricting movement of said wheel relative to said yoke.

3,937,480

SAFETY SKI BINDING

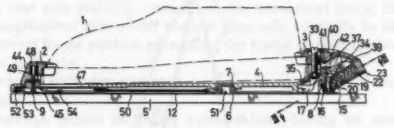
Heinz Korger, Munich, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed Feb. 21, 1974, Ser. No. 444,371

Claims priority, application Germany, Feb. 21, 1973, 2308602

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 T **13 Claims**



1. A safety ski binding for a ski comprising:

a soleplate adapted to be mounted on the ski for connecting a skiing boot to the ski;

a first sole holder in a forward position on the ski;

a second sole holder mounted in rear position on the ski;

a plate holder adapted to be attached to the ski;

releasing means on the second sole holder comprising detent means operative in response to an overload condition to release the soleplate from the ski comprising a female detent element mounted on said plate holder, a male detent element mounted on said soleplate and a detent spring means acting on said male detent element forcing said male element into engagement with said female element, said spring means being adjustable to change the force of engagement between said male and female elements thereby adjusting said releasing mean..

3,937,481

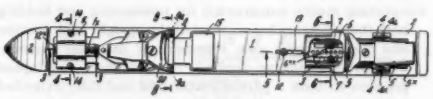
SKI CONSTRUCTION

Michael T. Koleda, 15 Murray Ave., Port Washington, L.I., N.Y. 11050

Filed Nov. 27, 1974, Ser. No. 527,584

Int. Cl.² A63C 9/08

U.S. Cl. 280—11.35 C **2 Claims**



1. In combination, a ski runner, an elongated plate mounted on the ski runner, and bodily movable thereon, toe and heel boot binding members carried by said elongated plate, means for adjusting one of said boot binding members forwardly or rearwardly on said elongated plate, teeth carried at the front of the elongated plate, a worm engaging said teeth and manually operable means for rotating said worm, whereby said elongated plate may be adjusted forwardly and rearwardly on the ski runner, and comprising a shaft carrying the worm, a casing affixed to the ski runner and in which the shaft and worm are mounted, one end of the shaft being exposed with a head adapted for manual rotation of the shaft and worm, and a spring member within the casing and engaged by the worm and abutting the front wall of the casing, whereby, when the front end of the ski runner abuts an obstruction, the stress and shock imposed on the ankle area of the skier by its continued forward movement when held by the bindings is alievated by cushioned forward movement of the elongated plate, and without changing the distance between the toe and heel members, or releasing their boot holding action.

3,937,482

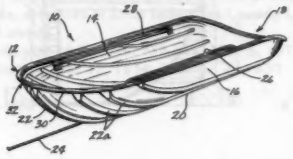
SELF-UPRIGHTING TOWABLE SLED FOR SNOWMOBILES AND THE LIKE

Merlin Johnson, 300 N. Fourth St., Clear Lake, Iowa 50428

Filed Oct. 1, 1973, Ser. No. 401,990

Int. Cl.² B62B 13/08

U.S. Cl. 280—18 **1 Claim**



1. A tow sled designed to upright itself after spills, said sled comprising,

a preformed hull having front and rear portions, oppositely disposed sides and a bottom, said hull having a length equal to approximately twice the width thereof,

said front portion being upwardly and laterally curved from said bottom to provide a generally rounded front portion having an upper forward edge which extends upwardly and forwardly,

said rear portion being upwardly and laterally curved from said bottom to provide a generally rounded rear portion, said rear portion having an upper rearward edge extending upwardly and forwardly and the forwardmost portion of which dwells in a horizontal plane no higher than the lowest horizontal plane in which the upper forward edge of said front portion dwells,

said sides being uniformly spaced apart from front to rear and transversely curved upwardly and outwardly from said bottom and having upper straight horizontal edges which merge with said upper rear and front edges,

a tow means positioned on said front portion below the center of gravity and closely adjacent said bottom whereby a towline may be connected to said tow means so that said towline is disposed substantially parallel to said bottom,

a roll bar means being secured to said upper edges of said front portion, said sides and said rear portion, said roll bar being substantially circular in cross section thereby preventing an edge catching on the ground when the sled is overturned,

a plurality of spaced apart runners being positioned on the outside surface of said hull, each of said runners having rearward and forward ends, the forward ends of said runners terminating at said upper edges, said runners comprising straight runners and curved runners, said straight runners being in a parallel relationship with respect to each other and positioned on opposite sides of said bottom along the longitudinal centerline of said sled,

the forward ends of said straight runners terminating at said upper edge of said front portion, said curved runners being laterally outwardly positioned in spaced apart relationship from said straight runners, and said curved runners having straight portions merging into forwardly positioned outwardly curved portions terminating at the upper front and side edges, said hull inside surface includes elongated cavities opposite each runner, said opposing runners and cavities being of equal length, width and depth, and

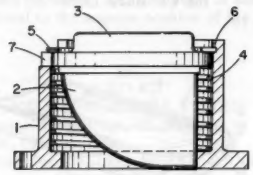
elongated longitudinal extending grasping members being provided on the upper inside surface of the oppositely disposed side walls of said hull.

3,937,483

TOBOGGAN RUDDER

Charles J. Simmons, 200 Pleasant St., East Longmeadow, Mass. 01028

Filed Dec. 13, 1974, Ser. No. 532,499
Int. Cl.² B62B *13/16*
U.S. Cl. 280—21 R 1 Claim



1. A device used for steering toboggans and like vehicles, said device being contained in a protective shell or housing mounted on a toboggan or an extension thereof entirely above the surface of snow and consisting of means for extending a steering element from a retracted position within said housing into the snow at an angle to the direction of vehicle motion, said steering element having a surface against which the snow exerts a force to produce steering action, wherein said device contains means for relieving the torque produced on the steering element by the forward motion of the vehicle, said relieving means consisting of a projection or tab and a slot into which said projection fits, said projection and slot being in combination between the housing and the steering element such that when the steering element is in its active position, that is, at an angle to cause left or right hand turning action, the projection is within the slot and acts to relieve the torque thereby allowing reduced size and effort on a knob or handle of the steering element.

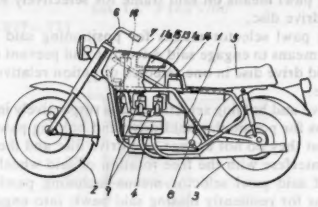
3,937,484

MOTORIZED TWO-WHEELED VEHICLE WITH NOVEL DISPOSITION OF FUEL TANK AND PARTS HOUSING

Minoru Morioka, Niiza, and Nagatoshi Katagiri, Saitama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 31, 1974, Ser. No. 519,700
Claims priority, application Japan, Nov. 2, 1973, 48-122717
Int. Cl. B62k *11/04*
U.S. Cl. 180—33 R 8 Claims

1. In a motorized two-wheeled vehicle having a frame, a front wheel, a rear wheel, a driver's seat at the upper middle portion of the frame, a steering handle at the front portion of the frame, an internal combustion engine mounted on said frame, and a fuel tank mounted on said frame below said seat, an improvement comprising a housing secured to the frame between the seat and the steering handle at a location above the engine such that the engine is exposed therebeneath, said housing being adapted for enclosing various parts therein, said housing having at least one chamber with an upper surface, an upper cover pivotably mounted at said upper surface to be opened upwards, said housing being open at its bottom surface, said parts in said housing including an air cleaner connected to the internal combustion engine below said housing and introduced into the housing through the open bottom surface.

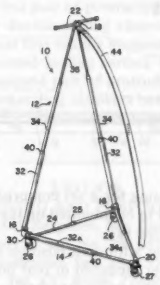


3,937,485

COLLAPSIBLE LUGGAGE CARRIER

Ruth W. Shourek, and John Edward Shourek, both of 17520 S. 70th Court, Tinley Park, Ill. 60477

Filed Aug. 1, 1974, Ser. No. 493,892
Int. Cl.² B62B *3/04*
U.S. Cl. 280—35 8 Claims



1. A portable luggage carrier comprising:

wheel means;

a frame including both a collapsible triangular upright back section adapted to extend upright, and, an attached triangular base platform portion adapted to extend horizontally and receive luggage for transport;

handle means mounted atop said back section;

hinge means providing for pivotal movement of the back section into a position adjacent to the base portion;

said upright back section including a pair of collapsible leg sections;

pivotal means joining said leg sections and said leg sections constructed to diverge downwardly and outwardly of said pivotal means;

said base portion including a pair of side members and joint means pivotally connecting said sides and said sides constructed to diverge outwardly of each other from said joint means; and,

connecting means constructed for positioning and holding both the diverging leg sections of the upright back portion and the diverging side members of the base portion, wherein said luggage carrier is movable from a collapsed position to both a partially extended and fully extended position;

said luggage carrier includes means mounting said wheel means and also includes movement compensating means operatively attached to said carrier to compensate for relative rotation between the leg sections of the upright back section and the side members of the base platform

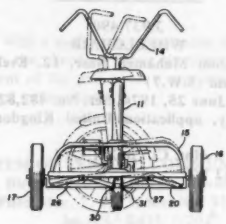
for the transport of luggage when said carrier is in the partially extended and fully extended position.

3,937,486

TIP OVER CONTROL FOR THREE WHEELED VEHICLES

Albert W. Weiters, 7438 Baker Ave., NE. Fridley Terrace, Minneapolis, Minn. 55432

Filed Aug. 22, 1974, Ser. No. 499,438
Int. Cl.² B62K *5/04, 5/08*
U.S. Cl. 280—87 R 6 Claims



1. A tip over control for three wheeled vehicles, which vehicles include a front, rotatable steering wheel assembly, a frame assembly including a rearwardly positioned laterally extending frame portion, said control including:

a. a rear axle pivotally connected, for movement about the longitudinal axis of the vehicle generally centrally to the lateral frame portion permitting the frame to shift relative to said axle;

b. wheels rotatably mounted on the respective ends of said axle;

c. linkage means including cable means having its ends operatively attached respectively to said axle on laterally spaced portions thereof and having its midsection wrapped about the steering assembly whereby the effective length of the cable means from said midsection to one of its axle connections will be lengthened when the steering assembly is rotated in one direction while the effective length of said cable means from its midsection to the other of its connections is shortened whereby the frame is shifted with respect to said axle upon rotation of the steering assembly said linkage means including;

1. a pair of lever elements rotatably mounted at their midpoints to the laterally extending frame portion and spaced outwardly from said axle connection;

2. the outer ends of said levers being attached to said axle; and,

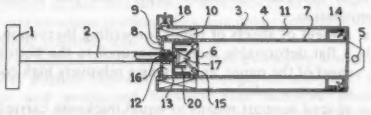
3. said cable means being connected to the inner ends of said levers.

3,937,487

TENSIONING DEVICE FOR USE PARTICULARLY WITH VEHICLE SAFETY BELTS

Bernard M. Pech, Paris, France, assignor to Societe Nationale des Poudres et Explosifs, France

Filed Jan. 7, 1975, Ser. No. 539,049
Int. Cl.² B60R *21/10*
U.S. Cl. 280—150 SB 10 Claims



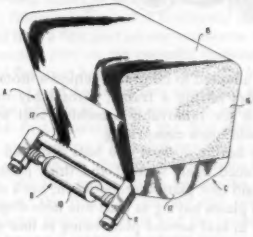
1. A tensioning device for use in tensioning an element, such as a vehicle safety belt, comprising a casing, a cylinder having front and rear ends defined within said casing, a first piston axially movable within said cylinder, a rod firmly fixed to said first piston and having means for attaching said element to be tensioned, an expansion chamber defined between said first piston and said front end of said cylinder, means for supplying gas at high pressure to said expansion chamber to move said first piston in a first direction along said cylinder and exert a tensioning force on the element attached to said rod, an auxiliary piston included in the first piston structure, a frangible element for holding said auxiliary piston in an initial position and adapted to fracture when the pressure in said expansion chamber reaches a predetermined level, permanently open passage means communicating the pressure in said expansion chamber to said auxiliary piston, and piston stopping means actuated in response to displacement of said auxiliary piston away from said initial position following fracture of said frangible element, to prevent movement of said first piston relative to said cylinder in the said first axial direction, but allow movement of said first piston relative to said cylinder in the opposite direction.

3,937,488

VEHICLE SAFETY DEVICE

Kenneth R. A. Wilson, Salem, Oreg., and Lorenz A. Palm, Fort Erie, Canada, assignors to Irvin Industries Canada Limited, Fort Erie, Canada

Continuation-in-part of Ser. No. 250,664, May 5, 1972. This application Feb. 22, 1974, Ser. No. 444,637
Int. Cl.² B60R *21/08*
U.S. Cl. 280—150 AB 6 Claims



1. A vehicle safety device adapted for attachment to a vehicle for protecting an occupant thereof during an accident, said vehicle safety device including impact bag means inflatable on crash impact by fluid flow thereinto, said impact bag means having a collapsed condition and an expanded operative condition for restraining movement of an occupant relative to the vehicle as the result of a crash impact, said impact bag means comprising in part a material from zero to low permeability with respect to the inflating fluid thereof and in part at least one other material having variable permeability which increases and decreases in relation to the fluid pressures within said impact bag means, certain areas of the bag being reinforced for added strength, and wherein the total flow rate of the inflating fluid through the material of the impact bag is within the range of $1800 < \epsilon\lambda_i S_i < 2300$ cubic feet per minute and wherein the area of the material of variable permeability is determined according to the formula:

$$\%S_1 = \frac{100}{S_{Tot.}} \cdot \frac{\Sigma\lambda_1 S_1 - \lambda_2 (S_{Tot} - S_3)}{\lambda_1 - \lambda_2}$$

wherein:

$\epsilon\lambda_1 S_1$ is the desired summation of flow through all pieces of fabric (λS for each piece) and

λ_1 is the weighted average of the permeability of the material of variable permeability,

λ_2 is the weighted average of the permeability of the material of zero to low permeability,

S_1 is the total of the design area of the material of variable permeability,

S_2 is the total of the design area of material of zero to low permeability,

S_3 is the area made relatively impervious by installation of reinforcing,

S_{Tot} is the total bag design area,

all values of λ are in terms of cubic feet per minute per square foot at 1 p.s.i.g,

and all values of S are in terms of square feet.

3,937,489

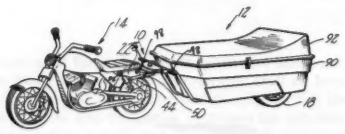
MOTORCYCLE TRAILER

Edward L. Hawes, 405 E. Goulson, Hazel Park, Mich. 48030; Allen R. Hawes, 453 E. Marshall, and Edward C. Hawes, 2129 Leitch, both of Ferndale, Mich. 48220

Filed May 16, 1973, Ser. No. 360,635

Int. Cl.² B62K *27/00*

U.S. Cl. 280—204 **9 Claims**



1. A trailer adapted to be towed behind a motorcycle or the like, said trailer having a frame, a rotatably mounted road wheel, a hitch for removably attaching said trailer to said motorcycle, said hitch comprising:

a first plate having at least one hole disposed therein;

parallel, spaced apart second and third plates to slidably receive said first plate therebetween, each of said second and third plates having at least one hole disposed therein, said hole in said second plate being in line with said hole in said third plate, said first plate, said second plate and said third plate being disposed in a generally horizontal plane,

a pin extending through said hole in said second plate, said hole in said third plate and said hole in said first plate to form a hinge having a generally vertical axis about which said motorcycle and said trailer can pivot with respect to each other, so that when said motorcycle is tilted from the vertical said trailer will be tilted in the same direction and generally at the same angle by the coaction of said first, second and third plates so that said pin is free of forces applied to said hitch by the tilting of said motorcycle;

means to attach said hitch to said motorcycle;

means to attach said hitch to said trailer frame, said means comprising two elongated first members, means to attach each of said elongated first members at one of its ends to said first plate; two elongated second members, means to attach each of said second members at one of its ends to said motorcycle; means to attach the other end of each of said elongated first members to the other end of a different one of said elongated second members, said elongated first members being hollow tubes, said means to attach each of said elongated first members to said first plate comprising means defining at least one transversely disposed slot in said first plate, means attaching said elongated tubes to said first plate through said transversely disposed slots, said elongated second members being hollow tubes, each of said elongated second members being axially and slidably receivable in a different one of said elongated first members; and said means to attach each of said elongated first members to a different one of said elongated second members comprising a plurality of alignable holes in said first and second members and means insertable through said holes to lock said members together.

3,937,490

WHEELCHAIR

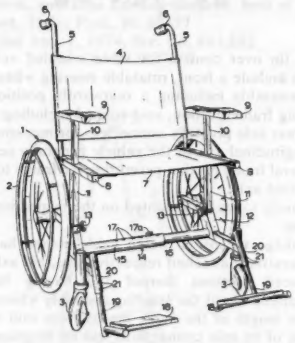
Ibrahim Abdelrahim Mohamed Nasr, 12, Evelyn Gardens, London, England (S.W.7)

Filed June 25, 1974, Ser. No. 482,829

Claims priority, application United Kingdom, June 27, 1973, 30460/73

Int. Cl.² B62M *1/14*

U.S. Cl. 280—242 WC **14 Claims**



1. A wheelchair including a chassis comprising spaced side frame means and adjustable interconnecting frame means extending between said side frame means; ground wheels mounted on said chassis; a flexible seat panel extending between said side frame means; means on said seat panel defining spaced attachment points for attaching said seat panel to both of said side frame means; a flexible back rest panel extending between and attached to the side frame means; means on said back rest panel defining spaced attachment points for attaching said back rest panel to both of said side frame means; and means for adjusting the length of said seat and back rest panels between their points of attachment to the side frames for varying the width of the seat of the chair to suit different widths of intended occupant.

3,937,491

NON-SKID RELEASABLE SHEET PAPER NOTE PAD

Anderson C. Hilding, 421 - 36th Ave. East, Duluth, Minn. 55807

Filed Dec. 12, 1974, Ser. No. 531,893

Int. Cl.² B42D *1/00, 5/00*

U.S. Cl. 281—15 B **2 Claims**

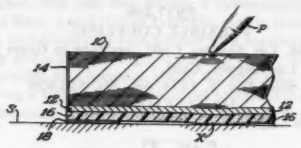
1. A non-skid releasable paper note pad comprising in combination:

a. a sheef of sheets of paper for writing thereupon,

b. a flat deformable member secured to the bottom of the sheef of the paper, and having a relatively high coefficient of friction relative to

c. spaced support means of equal thickness carried by said flat deformable member on the under surface adjacent the ends and sides of the deformable member and extending therefrom to thereby support the pad for sliding

movement upon the support means upon a supporting surface with the flat deformable member free of the supporting surface, said flat member deformed and in



contact with a surface upon pressure of a writing instrument on the sheef of paper thereby preventing sliding movement of the pad upon a supporting surface during the act of writing thereon.

3,937,492

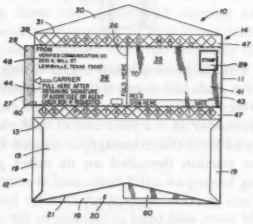
SYSTEM OF VERIFIED COMMUNICATION

Normand R. Biron, 2210 N. Mill St., Lewisville, Tex. 75067

Filed Mar. 7, 1973, Ser. No. 338,978

Int. Cl.² B41L 1/20

U.S. Cl. 282—25 **5 Claims**



1. A mailing instrument comprising:

a body formed of sheet material separated by parallel spaced fold lines into an envelope portion, a cover portion, and a sealing flap portion;

said envelope portion having a pocket for receiving a document therein and a pressure-sensitive reproducing means on the interior of said pocket whereby information markings made on the exterior of said envelope will be likewise formed on said document when said document is in said pocket;

adhesive on one side of said flap portion;

said cover portion being positioned between said envelope portion and said flap portions, said cover portion being of a size to fold adjacent to and over one side of said envelope portion whereby said flap can be folded along the other side of said envelope portion and adhesively attached thereto thereby sealing said pocket for mailing;

pressure sensitive reproducing means on one side of said cover portion positioned coextensive with said reproducing means on the inside of said pocket when said cover portion is folded to said mailing position whereby markings made on said cover portion will be likewise formed on said envelope portion when said cover portion is folded to said mailing position;

adhesive material on said one side of said cover portion adjacent to said fold lines for attachment to said one side of said envelope portion when said cover portion is in said mailing position; and

a pair of spaced weakened tear lines extending across said cover portion between the side edges of said cover portion and positioned between said adhesive portions whereby the part of said cover portion between said tear lines may be detached from said instrument, an informational spaces on said other side of said cover portion between said tear lines adapted for addressee information and endorsement by the recipient whereby said reproducing means on said cover transfers said information written in said informational spaces to the envelope portion and said reproducing means on said pocket transfers said information to said document in said envelope portion and an information space on said one side of said cover portion between said tear lines adapted for return address information so that said detached part may be mailed back to the sender.

3,937,493

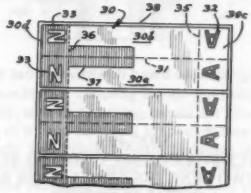
COLOR CODED LABELS AND FILE FOLDERS

David J. Fasbender, Hastings, Minn., assignor to The Smead Manufacturing Company, Hastings, Minn.

Filed Sept. 30, 1974, Ser. No. 510,288

Int. Cl. B41f 21/00

U.S. Cl. 283—41 **8 Claims**



1. For use with either an end tab file folder or a top tab file folder, a file folder label in a flat horizontal condition having a central fold line, a first part on one transverse side of the fold line and a second part on the opposite transverse side of the fold line, said first part having a first character indicia thereon, and said second part having a first character indicia thereon that when the label is in a flat condition is oriented at right angles to the first character on the first part, the first and second part each having a first end portion, a central portion and second end portion, the first end portions being adjacent one another, the first end portions having the first character indicia thereon, the first part second end portion having a second character indicia thereon and the second part second end portion having a second character indicia thereon that is the same as the second character indicia on the first part second end portion and is oriented at right angles relative thereto.

3,937,494

BLEEDING PROTECTIVE CASING ASSEMBLY FOR BEARING SYSTEM

George E. Hicks, Fresno, Calif., assignor to Weather Tec Corporation, Fresno, Calif.

Filed Sept. 13, 1973, Ser. No. 396,836

Int. Cl.² F16L 27/08

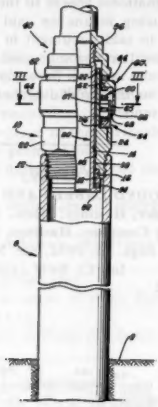
U.S. Cl. 285—13 **6 Claims**

1. A longitudinally expansible casing assembly for shielding internal operative members from the entrance of external dirt comprising:

outer wall means forming a vertically oriented annular chamber surrounding the operative members and subject to gradual leakage of liquid thereinto, said outer wall means including an annular cup-shaped case having a generally cylindrical outer sidewall and an open top, and

an annular cap covering the open top of the case, including a downwardly depending sidewall disposed concentrically

outwardly of the case sidewall in longitudinally expansible telescoping relation therewith, and check valve means



for allowing liquid to bleed downwardly out of the chamber.

3,937,495

APPARATUS FOR CONNECTING AND SEALING TOGETHER TWO LENGTHS OF CYLINDER BARREL OF A WORM EXTRUDER

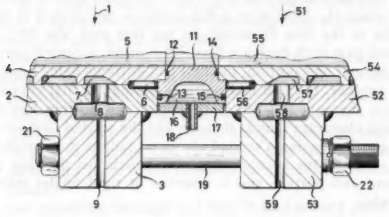
Dietmar Anders, Hannover-Kleefeld, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed Apr. 7, 1975, Ser. No. 565,952

Claims priority, application Germany, Apr. 18, 1974, 7413472[U]

Int. Cl.² F16L *53/00*

U.S. Cl. 285—41 2 Claims



1. Apparatus for connecting and sealing together two lengths of a cylinder barrel of a worm extruder, each length of cylinder barrel comprising an inner cylindrical member and an outer cylindrical member disposed concentrically thereabout with at least one duct for flow of temperature controlling fluid provided between said inner cylindrical member and said outer cylindrical member, said apparatus comprising a ring having end faces engaging between adjoining ends of said two lengths of cylinder barrel, said ring having an inner and outer periphery, said ring inner periphery having an inside diameter which corresponds to the inside diameter of said inner cylindrical members, said ring end faces abutting end faces of said outer and inner cylindrical members and sealing rings between the abutting faces, said ring being formed with a circumferential recess in its outer periphery, and means attached to the outer periphery of said ring covering said recess, means communicating with said recess which can be connected to a source of temperature controlling fluid, and clamping means at the ends of said outer cylindrical members clamping said ring sealingly between said outer and inner cylindrical members.

3,937,496

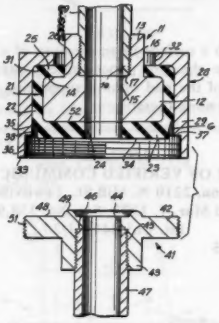
FLEXIBLE COUPLING

Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Inc., Los Angeles, Calif.

Filed Dec. 9, 1974, Ser. No. 530,939

Int. Cl.² F16L *19/02*

U.S. Cl. 285—52 2 Claims



1. A pipe coupling comprising a first fitting having a base portion with a reduced diameter stem extending outwardly from one surface thereof for receiving a pipe end, and defining an annular shoulder at the root end of said stem, said fitting having an axial bore therethrough, a second fitting having a circular base portion threaded on its outer periphery, said second fitting having an axial bore, said second fitting including on the base portion thereof an annular bead closely surrounding said bore, said bead projecting in the direction of the axis of said fitting beyond the surface of said base portion, a pipe receiver portion on said second fitting, a cylindrical connector sleeve encompassing said base portion of said first fitting and having an inwardly extending annular flange at one end defining an opening of diameter less than the diameter of said base portion of said first fitting, and through which said stem extends, internal thread means formed on said other end of said connector sleeve adapted to receive said threaded outer periphery of said second fitting axially, displaceably to connect said second fitting and said sleeve, and a resilient, deformable member encompassing said base portion of said first fitting and having an axial bore aligned with and forming a continuation of the axial bores of said first and second fittings, said member including a cylindrical floor engaging said base portion of said second fitting, said floor including an annular recessed bevel portion of lesser diameter than the diameter of the remainder of said floor, said bevel portion, in the unstressed condition of said deformable member, being of lesser diameter than the inner diameter of said connector sleeve, increments of said bevel portion being pressed into engagement with said inner diameter of said sleeve and said bead being embedded into the body of said floor when said deformable member is compressed between said fittings.

3,937,497

DRAIN JOINTING SYSTEM

Altee C. Studer, 9818 Hawley Road, El Cajon, Calif. 92020

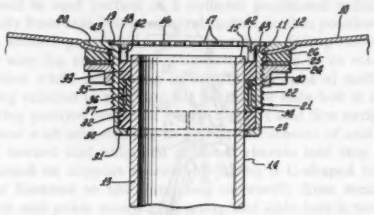
Filed May 15, 1974, Ser. No. 470,128

Int. Cl.² F16L *17/02*

U.S. Cl. 285—111 5 Claims

1. A sealing joint assembly for joining a drain pan with a drain pipe through a drain hole in said pan and comprising a fitting having an inside wall larger in diameter of the outside of the drain pipe whereby with the fitting in place forming an annular cylindrical pocket between said inside wall and the

outside of the drain pipe and said fitting having an annular radially inwardly extending rim at one end of the fitting forming a bottom for said pocket, the improvement comprising, a first ring of synthetic plastic resin material at the bottom of said pocket, said first ring having a substantially solid cross sectional form, a seal ring of synthetic plastic resin material of resilient consistency in said pocket at a location above said first ring and a second ring of synthetic plastic resin material in said pocket at a location above the seal ring, said second ring having a substantially solid cross sectional form, said seal ring comprising spaced inner and outer wall sections and a



bottom wall joining said inner and outer wall sections, said inner wall section being in initial position tilted diametrically inwardly away from the outer wall section to a position wherein the innermost portion of said inner wall section initially has a diameter smaller than the diameter of the outside of said drain pipe, and an annular bead on one of said wall sections at a location facing the other wall section having when assembled a relatively narrow annular line of engagement with said other wall section whereby to increase the sealing effect between said inner wall section and said drain pipe.

3,937,498

HOSE COUPLING

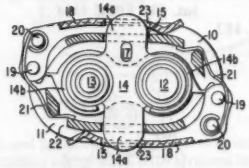
Karl Weinhold, IM Jagdfeld 43, 4040 Neuss, Germany

Filed June 22, 1973, Ser. No. 372,754

Claims priority, application Germany, June 22, 1972, 2230463

Int. Cl. F16l *39/02*

U.S. Cl. 285—243 **11 Claims**



1. A twin hose coupling, comprising a pair of elongated nozzles arranged side-by-side and having substantially parallel longitudinal axes; a casing including a pair of shell sections hingedly movable relative to one another between an open position and a closed position in which said nozzles are substantially coaxially accommodated in said casing, and each provided with a substantially centrally located recess; a mounting member in said casing extending normal to said axes and into said recesses and connecting said nozzles to one another; arcuate flanges provided on said shell sections and being coaxial with the respective nozzles when said shell sections are in said closed position, and to press a twin hose slipped over said nozzles against the same; and tension lever latch means provided at one circumferential end of said casing and having a tension lever which abuts one of said shell sections; and further comprising an additional tension lever latch provided at the opposite circumferential end of said casing and having an additional tension lever which abuts the other of said shell sections 9, means for drawing said shell sections together in said closed position so as to clamp the twin hose between said flanges and said nozzles.

3,937,499

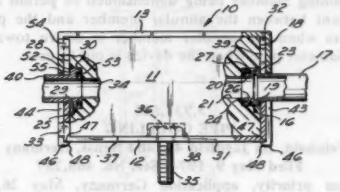
MOUNTING FOR NONMETALLIC VALVES

Louis B. Courtot, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Sept. 23, 1974, Ser. No. 508,522

Int. Cl.² F16L *39/00*

U.S. Cl. 285—319 **5 Claims**



1. An assembly for coupling a fluid line, comprising a nonmetallic body, said body having means for receiving and sealing the end of a fluid line, and bracket means in engagement with said body, said bracket means including means for resisting forces tending to separate the line from the body, said bracket means including means integral with said force resisting means for mounting said body to said bracket means, said bracket means including snap connecting means for releasably securing said body to said bracket means, said bracket means comprising a pair of interengaged bracket members, said interengaging bracket members having complementary U-shapes, the legs of one of said members being arranged to telescope over the legs of the other.

3,937,500

DEVICE FOR CONNECTING TELESCOPING PIPES

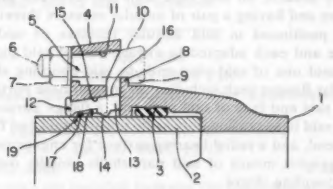
Toshiyuki Sato, 174-banchi, 569 Osaka, Takatsuki, Nobori, Japan

Filed June 18, 1974, Ser. No. 480,486

Claims priority, application Japan, June 19, 1973, 48-73015

Int. Cl.² F16L *21/06*

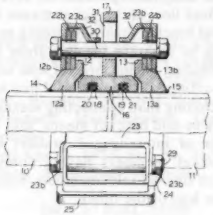
U.S. Cl. 285—323 **3 Claims**



1. A device for interconnecting a large-diameter pipe and a small-diameter pipe inserted in one end thereof comprising a plurality of drawing means each having an engaging portion engageable with an outer peripheral projection on the large-diameter pipe, an annular member holding the drawing means and fittable around the small-diameter pipe, a plurality of pressing members interposed between the inner surface of the annular member and the outer surface of the small-diameter pipe and each having a wedge projection, said pressing members being inserted in recesses formed in the inner surface of said annular member, and a substantially circular ring-like

retaining member for preventing removal of the pressing members from the annular member when the device is not in use, said circular ring being fitted in grooves formed in the inner surface of the pressing members and in grooves formed in the inner surface of the circular member, at least one of the inner peripheral surfaces of the annular member and the outer peripheral surface of each of the pressing members being in the form of a slanting surface for causing the pressing member to move toward the outer peripheral surface of the small-diameter pipe and to thereby force the wedge projection against the outer peripheral surface of the small-diameter pipe by the movement of the annular member toward the large-diameter pipe when the annular member is drawn toward the large-diameter pipe by the drawing means, said grooves and the retaining member being dimensioned to permit relative movement between the annular member and the pressing members when the annular member is drawn toward the large-diameter pipe when the device is put to use.

3,937,501
PIPE COUPLING
Karl Weinhold, Im Jagdfeld 43, 404 Neuss, Germany
Filed May 9, 1974, Ser. No. 468,267
Claims priority, application Germany, May 26, 1973, 2327050
Int. Cl.² F16L *21/02, 21/06*
U.S. Cl. 285—365 **4 Claims**



1. A quick coupling for coupling two pipe ends comprising an annular flange secured on each of said pipe ends and spaced from the end faces of said pipe ends, a plurality of part shells, a clamping lever lock for connecting adjacent ends of a first and second of said part shells, engagement means on said part shells for engagement behind said annular flanges, means for hingedly connecting the remaining adjacent ends of said plurality of part shells, an intermediate coupling sleeve axially slidable on said pipe ends and between said annular flanges and having a pair of annular recesses therein, annular seals positioned in said annular recesses of said coupling sleeve and each adapted to engage one of said pipe ends to seal said one of said pipe ends to said coupling sleeve, said annular flanges each including an annular base portion spaced from said end face of said pipe end, a flange portion inclined from said base portion outwardly towards said end face of said pipe end, and a radial bearing surface for engagement by said engagement means of said part shells radially outwardly of said coupling sleeve.

3,937,502
DUMP BOX ASSEMBLY
James E. Gay, Fargo, N. Dak., assignor to Mobility, Inc., Fargo, N. Dak.
Filed Sept. 30, 1974, Ser. No. 510,454
Int. Cl.² B65G *67/50*
U.S. Cl. 298—11 **14 Claims**

1. A dump box assembly mountable on the bed of a vehicle for transfer of a bulk material to a remote receiver, said dump box assembly comprising:

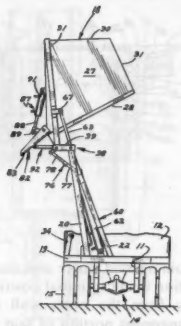
a support frame mountable on said vehicle bed;

a dump box located above said vehicle bed and having a dumping side defining an upper dumping edge;

at least one link assembly including a link member having a fixed end pivotally assembled to said support frame, and a free end pivotally movable between a first downwardly extended position relative to said support frame and a second outwardly extended position;

means to limit pivotal movement of said free end of said link member beyond said second extended position;

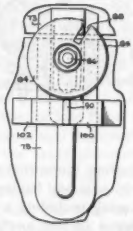
said free end of said link member being pivotally assembled to said dump box proximate the upper dumping edge



thereof providing an axis for elevated rotation of said dump box about the free end of said link member, said dump box being located on said vehicle bed when said link member is in the first position, and movable to an elevated position about the vehicle bed when said link member is moved to the second position; and

elevating means operable to elevate said dump box and dump box axis to a position wherein the free end of said link member is in said second extended position, and then rotate said dump box about the free end of said link member in the second extended position.

3,937,503
ROTARY LATCH LOCK
Carson E. Harris, 402 Wheaton Road, Hampton, Va. 23666
Filed July 3, 1974, Ser. No. 485,738
Int. Cl.² E05C *1/04*
U.S. Cl. 292—153 **3 Claims**



1. A latching means resistant to accidental opening such as caused by vibration of the means on which the latching means is mounted, said latching means comprising a slide-bolt, actuator means extending outwardly from said slide-bolt, guide means supporting said slide-bolt for axial movement between an extended or locking position and a retracted or unlocked position, a rotary latch lock means mounted on said actuator means for movement along a path of movement therewith, means mounting said rotary latch lock on said actuator means for rotation about an axis perpendicular to the axis of said

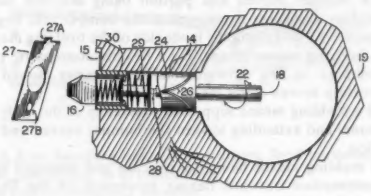
slide-bolt, a fixed stop lug mounted in the path of movement of said rotary latch lock, compressible vibration damping means clampingly engaged between said actuator means and said rotary latch lock for resisting rotation of said latch lock for holding said rotary latch lock in any rotary position of adjustment notwithstanding the vibrations of the means on which the latching means is mounted while permitting manual rotary adjustment of said rotary latch lock to another position of rotational adjustment, said rotary latch lock including a first peripheral surface comprising a portion of a cylinder and a second peripheral surface portion in a chordal plane with respect to said portion of a cylinder positioned radially inwardly from said first peripheral surface so that positioning of said second peripheral surface portion in facing relation to said stop lug enables said slide-bolt to move to its retracted position while positioning of said first peripheral surface in facing relation to said stop lug when said slide-bolt is in said locking position results in engagement of said first peripheral surface with said stop lug to prevent movement of said slide-bolt toward said unlocked position wherein said stop lug is mounted on support means comprising a U-shaped bracket plate fastened to and extending outwardly from means on which said guide means supporting said slide-bolt is mounted with said U-shaped bracket plate including a spanner portion extending transversely across and spaced outwardly from said slide-bolt, said stop lug extending outwardly from said spanner portion, said second peripheral surface of said rotary latch lock comprising the bottom of a generally rectangular slot extending inwardly from said first peripheral surface and dimensioned to matingly fit over said stop lug when aligned therewith.

3,937,504

PUSH AND PULL DOOR LATCH

Richard Lee McElroy, 6205 Ave. Juan Diaz, Riverside, Calif.

Filed Oct. 3, 1974, Ser. No. 511,506
Int. Cl.² E05C *1/14*
U.S. Cl. 292—164 **5 Claims**



1. In a push and pull door latch, the combination of; a main housing, two sliding plates each with a recess in its outer face having a handle means disposed across said recess, each sliding plate being mounted within said main housing and being a separately constructed member having a peripheral wall extending in the direction of its insertion into the main housing, each being inserted from opposite sides, thereby the two being transversely opposed from one another, said sliding plates each acting as a plunger, a latch bolt operating gear rack disposed between said sliding plates, each said sliding plate being directly transversely connected to opposite ends of said rack and slidable together with said rack.

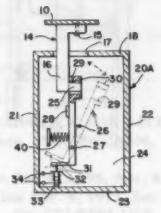
2. In a latch, the combination of a latch bolt housing, a latch bolt and a hollow pinion open at one end, the end of the latch bolt opposite the latch carrying end extending into the open end of the said pinion, the hollow pinion acting as a sleeve in a running fit to the latch bolt, the said latch bolt and pinion having a key and keyway association in their said connection providing means for said latch bolt to transversely slide in or out of said pinion while turning with said pinion, the latch bolt housing and latch bolt including cooperative cam means whereby turning of the pinion and thus the latch bolt results in retracting and projecting the latch bolt.

3,937,505

ELECTRIC HOOD LATCH FOR VEHICLES

Edward Dempsey, Bronx, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Mar. 13, 1974, Ser. No. 450,825
Int. Cl.² E05C *3/30*
U.S. Cl. 292—201 **6 Claims**



1. A locking device for a vehicle hood and the like, which comprises:

a. a main locking mechanism housing having a plurality of walls, a main chamber therein, and an entrance opening formed in one of said walls;

b. anchoring means for securing said housing to an interior of a hooded vehicle compartment;

c. a movable elongated latch bar member contained in said housing, said movable elongated latch bar member having an enlarged upper end making said bar member slightly top heavy, said latch bar member pivoted intermediate said enlarged upper end and a lower end;

d. a locking bar post securable at its upper end to said vehicle hood, said bar post of an EL shape to form a latching finger at its lower end, said locking bar post and said latching finger extensible through said entrance opening into said main chamber;

e. a latching means carried on said enlarged upper end of said latch bar member for releasably lockingly engaging with said latching finger of said locking bar post for holding the same against being unlocked when said latch bar member is moved into locking position; and

f. electromagnetic means contained in said housing beside said lower end of said bar member.

3,937,506

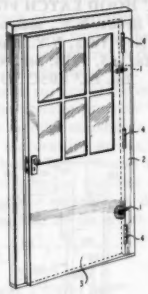
DOOR SECURITY PIN

Joe O. Dean, 5841 NE. 22nd Ave., Fort Lauderdale, Fla. 33308

Filed Sept. 19, 1974, Ser. No. 507,441
Int. Cl.² E05C *19/18*
U.S. Cl. 292—300 **6 Claims**

1. A security pin installed between the hinge side of a door jamb and a door edge, comprising a threaded portion inserted into the door jamb, a body portion integrally connected to the threaded portion, said threaded portion being of a reduced diameter to thereby form a shoulder between the body portion and the threaded portion for limiting the insertion of the pin into the door jamb, polygonal surfaces provided on said body portion adapted to be engaged by a suitable tool to facilitate the insertion of the threaded portion of the pin into the door jamb, and a pointed portion on the free end of the body portion for forming an indentation in the edge of the door to thereby facilitate the alignment of the longitudinal axis of the pin with a hole to be formed in the edge of the door at the point of indentation, a hole formed in the edge of the door,

said hole being positioned in alignment with the pointed end of the pin, whereby during the normal opening and closing of



the door, the body portion of the pin is respectively removed from and inserted into the hole.

3,937,507

PADLOCK

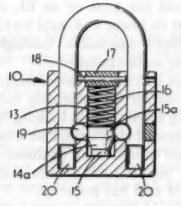
John McCoag, Glasgow, Scotland, assignor to Aardee Spring & Lock Company Limited, Glasgow, Scotland

Filed July 22, 1974, Ser. No. 490,842

Claims priority, application United Kingdom, Aug. 24, 1973, 40154/73

Int. Cl.² B65D *27/30*

U.S. Cl. 292—319 **10 Claims**



1. A keyless disposable padlock comprising a body portion having two substantially parallel bores, a shackle having two limbs capable of insertion into the respective bores of the body portion, a cross-bore in the body portion partially intersecting with at least one of the bores and having its cross-section eccentric relative to the bore which it intersects, engaging means in the cross-bore, means biassing the engaging means to a position in the partial intersection of the cross-bore and at least one of said bores, at least one limb of the shackle for insertion into at least one intersected bore havingn a portion arranged to be engaged by the engaging means automatically when the limb is inserted into the bore so that the engaging means lies trapped in said partial intersection between the engaged limb of the shackle and the opposite wall of the cross-bore, the engagement by the engaging means preventing movement of at least one limb along at least one of said bores whereby the padlock cannot be opened without damaging at least one of the component parts of the padlock.

3,937,508

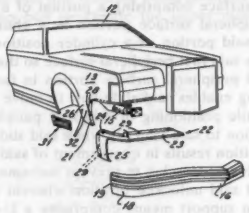
VEHICLE BODY AND BUMPER ASSEMBLY

Patrick M. Glance, Plymouth; James E. Moroney, Southfield, and Peter M. Ross, Jr., Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 26, 1974, Ser. No. 536,662

Int. Cl.² B60R *19/02*

U.S. Cl. 293—63 **5 Claims**



1. A vehicle body and bumper assembly comprising:
a vehicle body having rigid side panels,
a bumper,
and energy absorbing means extending between the vehicle body and the bumper supporting the latter in spaced relationship to the vehicle body for movement longitudinally of the latter upon impact,
the bumper extending across the width of the body and having curved end portions terminating substantially in alignment with the side panels,
each bumper curved end portion having its end spaced from the adjacent end of a side panel,
bridging means bridging the space between each bumper curved end portion and the side panel aligned with the latter,
each bumper curved end portion being movable during energy absorbing movement of the bumper into engagement with and along the inner side of the bridging means,
the bridging means comprising a flexible elastomeric panel adapted to flex outwardly as the bumper curved end portion moves along the inner side thereof,
and a molding means supported externally of the body side panel and extending toward the bumper curved end portion,
the molding means being constructed and arranged to accommodate outward flexing movement of the flexible panel.

3,937,509

ANIMAL FECES COLLECTING DEVICE

Frank W. Hufnagel, Pompano Beach, Fla., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

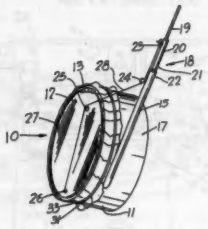
Filed Oct. 15, 1974, Ser. No. 514,636

Int. Cl.² A10K *23/00;* **A01K** *29/00*

U.S. Cl. 294—1 R **2 Claims**

1. An animal feces collecting device adapted to scoop animal feces from the ground, which comprises:
a. a cylindrically shaped container having an open top end and an outside longitudinal surface;
b. a hollow tube affixed tangentially to said outside longitudinal surface;
c. a tube engaging section slidably mounted into said hollow tube;
d. a handle section telescopically communicating with said tube engaging section;
e. a flat circular disc top cover hingably mounted to an open top end of said container;
f. a first eye hook affixed to said tube engaging section;
g. a second eye hook affixed to said hollow tube;

h. Third and fourth aligned eye hooks affixed to a top surface of said cover;



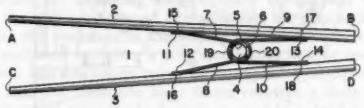
g. a string tied to said fourth eye hook, threaded through said second and third eye hooks, and tied to said first eye hook, said tube engaging section sliding back and forth within said hollow tube causing said cover to open and close upon said container.

3,937,510

COUPLED CHOPSTICKS

Hyok Sang Lew, 17776 W. 14th Ave., No. 2, Golden, Colo. 80401

Filed May 29, 1973, Ser. No. 364,878
Int. Cl.² A47G *21/10*
U.S. Cl. 294—16 **9 Claims**



1. A food handling utensil for grasping food particles, said utensil comprising in combination:
   a. a pair of elongated member;
   b. a flexible coupling disposed intermediate said members for maintaining said members in essentially the same plane;
   c. said coupling including:
      1. a first coil spring having a first pair of arms extending therefrom;
      2. a second coil spring having a second pair of arms extending therefrom; and
      3. means for attaching said first and second coil springs to one another in axial alignment disposing said arms like quatrefoil.

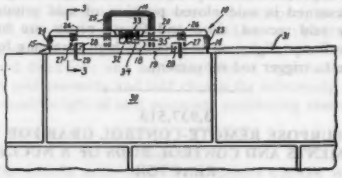
3,937,511

MORTAR TOOL

Andrew J. Inzerill, 24 Mill St., Tobyhanna, Pa. 18466

Filed Aug. 15, 1974, Ser. No. 497,664
Int. Cl.² E04G *21/20*
U.S. Cl. 294—16 **5 Claims**

1. A mortar tool comprising a pair of elongated generally rectangularly shaped, accurately spaced apart jaws, mating hinge means at the remote ends of each of said rectangularly shaped jaws and at the center portions thereof, a pair of guides having integral depending guide fingers secured to one of said jaws, spring loaded means normally urging said jaws apart, and



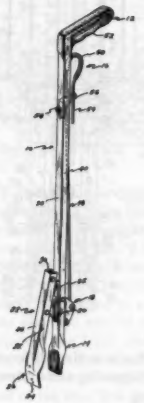
hand activated means for moving said jaws together to hold mortar.

3,937,512

GRAB-STICK FOR LITTER

Harold E. Baughman, P.O. Box 6506, Santa Rosa, Calif. 95406

Continuation of Ser. No. 413,195, Nov. 6, 1973, abandoned.
This application Apr. 9, 1975, Ser. No. 566,346
Int. Cl.² B25J *1/00*
U.S. Cl. 294—19 R **8 Claims**



1. A grab stick for picking up litter comprising in combination an elongated support column having a laterally projecting hand grip portion at its upper end and a gripper jaw portion at its lower end, an elongated swing leg pivotally connected at its upper end by a first pivot to said support column on that side thereof opposite to said hand grip portion and adjacent a lower end of said support column, said elongated swing leg having a gripper jaw portion at its lower end for swinging toward and away from the gripper jaw portion of said support column between respective closed and opened clamping positions, a control link member pivotally connected at one end thereof by a second pivot to said support column on that side of the support column from which said hand grip portion projects, a pull rod projecting through said support column and pivotally connected by a respective third and fourth pivots at its opposite ends to said swing leg and to said control link member, a trigger rod pivotally connected by a fifth pivot to said control link member between said second and fourth pivots and extending therefrom to terminate in a finger grip immediately below said hand grip portion, spring means for swinging said swing leg normally to its opened position to seat said control link member against said support rod, imaginary lines between said second and third pivots, said second and fourth pivots and said third and fourth pivots in said opened position of said gripper jaw setting-off a triangle of a predeter-

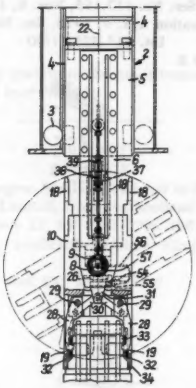
mined height as measured by an imaginary line from said second pivot normal to the imaginary line between said third and fourth pivots, and said predetermined height being appreciably lessened in said closed position of said gripper jaw whereby said second, third and fourth pivots are brought closer to linear alignment to produce high clamping force in response to trigger rod movement.

3,937,513

DUAL-PURPOSE REMOTE-CONTROL GRAB FOR FUEL ELEMENTS AND CONTROL RODS OF A NUCLEAR REACTOR

Bernhard Hoffmeister, Wilhelmshaven, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Oct. 29, 1974, Ser. No. 519,005
Claims priority, application Germany, Nov. 28, 1973, 2359163
Int. Cl.² G21C *19/10*
U.S. Cl. 294—86 A **12 Claims**



1. An apparatus for inserting differently shaped elongated objects into and withdrawing same from respective holes, said apparatus comprising:

a vertically displaceable support;

a head pivotally mounted on said support and having a pair of sides;

grab means on one side of said head having a formation complementarily shaped for locking on an object of a predetermined shape;

grab means on the other side of said head having a formation complementarily shaped for locking on an object of another different predetermined shape; and

means for pivoting said head on said support between two positions each corresponding to alignment of a respective grab means with a respective object.

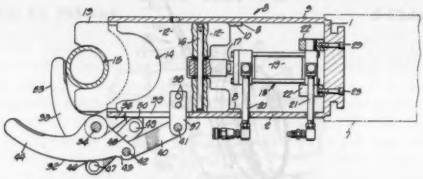
3,937,514

GUIDE HEAD FOR PIPE RACKERS

Faustyn C. Langowski, Houston, Tex., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Nov. 22, 1974, Ser. No. 526,208
Int. Cl.² E21B *19/00*
U.S. Cl. 294—88 **5 Claims**

1. A pipe guide head for well pipe racking apparatus comprising: a hollow body having means at one end for connection with a supporting and positioning structure, guide means at the other end of said body for receiving and guiding a length of pipe, said guide means including a slide plate, means reciprocably supporting said slide plate for extension and retraction with respect to said body, actuator means associated with said body and said slide plate for reciprocating said slide plate, said slide plate having a pipe receiving opening in its end, retainer means mounted on said body and movable between an open position and a closed position for retaining a pipe in said



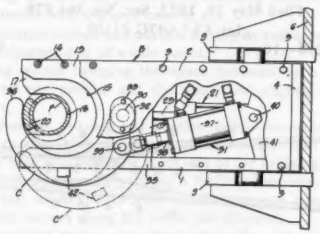
opening, and linkage means associated with said slide plate and said retainer means for moving said retainer means to said open position in response to retraction of said slide plate and for moving said retainer means to said closed position in response to extension of said slide plate.

3,937,515

HEAD FOR PIPE RACKERS

Faustyn C. Langowski, Houston, Tex., assignor to Byron Jackson Inc., Long Beach, Calif.

Filed Nov. 22, 1974, Ser. No. 526,206
Int. Cl.² E21B *19/14*
U.S. Cl. 294—88 **6 Claims**



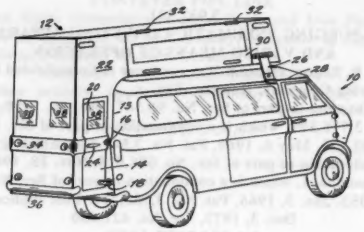
1. A pipe-supporting head for well pipe racking apparatus comprising: a body having side walls, means providing a pipe-receiving aperture between said side walls and open at one end of said body, arcuate, pipe-supporting means carried by said body at the inner end of said aperture, a claw member, first pivot means mounting said claw member on said body for pivotal movements between an open position, in which said claw member is retracted from said aperture to permit a pipe to enter said aperture and be supported by said pipe-supporting means, and a closed position, in which said claw member engages a pipe supported by said pipe-supporting means to retain the pipe within said aperture, a portion of said claw member projecting laterally outside of one only of said side walls, extensible and contractible actuator means for pivoting said claw member between said positions, said actuator means including second pivot means connecting one end of said actuator means to said body, and third pivot means connecting the other end of said actuator means to said claw member at a location offset from said first pivot means, said pipe-supporting means, said first pivot means and said second pivot means being aligned longitudinally of said body and centrally of said side walls, said claw member and said actuator means being selectively arrangeable in said body to enable said claw member to pivot on said first pivot means from said open position to said closed position in a given sense, and, optionally, in the opposite sense.

3,937,516

EXTENSION COMPARTMENT FOR MOTOR VEHICLE

Joe W. Chapman, 8364 Fairview Ridge Road, Lesage, W. Va. 25537

Filed Nov. 16, 1973, Ser. No. 416,459
Int. Cl.² B62C *1/06*
U.S. Cl. 296—26 13 Claims



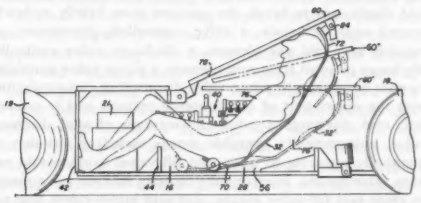
1. For a wheeled vehicle having a door frame, a forwardly opening enclosure including a pair of spaced side walls, a top wall and a bottom wall, and means for releasably securing said enclosure to the vehicle with its forward open end opening into the vehicle through its door frame including a generally rectangular mounting frame having top, bottom and spaced side members connected one to the other, and means for releasably securing said mounting frame to the door frame with the mounting frame disposed substantially concentrically within the vehicle door frame and with the sides, top and bottom frame members adjacent corresponding margins of the door frame, a seal for sealing between said enclosure and the vehicle when the enclosure is secured to the vehicle, means carried by said frame and said enclosure for releasably securing said enclosure and said frame one to the other including cooperating fastening elements carried by said frame and said enclosure for displacing said enclosure toward said vehicle with the seal between said enclosure and the vehicle thereby sealing the enclosure to the vehicle, one of the side walls of said enclosure including a door frame adjacent the open end thereof, said enclosure being located relative to the vehicle such that the enclosure door frame receives a door of the vehicle when the vehicle door is opened to extend substantially parallel to and in substantially coplanar relationship with said one side wall.

3,937,517

PROTECTIVE CANOPY

William J. Donovan, and G. Robert Frey, both of Franklin, Pa., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Filed May 13, 1974, Ser. No. 469,185
Int. Cl.² B60N *1/04*
U.S. Cl. 296—68 8 Claims



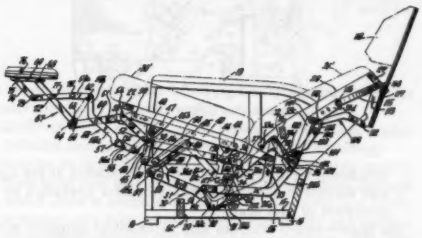
1. A mobile machine comprising: a chasis; a canopied occupant positioning assembly carried by said chassis; said positioning assembly including an occupant support portion and an overlying rigid canopy portion and being adapted to receive an occupant therewithin and to orient such occupant to face in a forward direction; said canopy portion being pivotally connected adjacent one peripheral portion thereof to said chassis and connected adjacent an opposite peripheral portion thereof with said support portion; said one peripheral portion being spaced from said opposite peripheral portion in said forward direction; and adjusting means communicating between said assembly and said chassis for selectively adjusting the overall height of said occupant positioning assembly.

3,937,518

RECLINER LOUNGER T-CUSHION CHAIR WITH PROJECTIBLE HEADREST AND LEGREST, AND HARDWARE THEREFOR

Kenneth S. Harrison, Ridgefield Park, N.J., assignor to Mohasco Corporation, Amsterdam, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,641
Int. Cl.² A47C *1/03*
U.S. Cl. 297—61 16 Claims



1. Hardware for a T-cushion chair comprising a seat link, an arm mounting link, a back mounting link pivoted to the arm mounting link and movable from upright position to T.V. and fully reclined positions, a toggle bar, a toggle bar connector link pivotally connected to said back mounting link and also pivoted to said toggle bar near the rear end of said toggle bar, a rear pivot link pivotally connected to said toggle bar, and to said seat link adjacent the rear end of said seat link, a front pivot link pivoted adjacent the front end of the toggle bar, a link pivoted to said front pivot link above the pivotal connection of said front pivot link to said toggle bar, to said seat link closer to the front end of the seat link than to the rear end of said seat link, said back mounting link having an arm projecting downwardly from its pivotal connection to said arm mounting link to its pivotal connection to said toggle bar connector link, said arm of said back mounting link swinging forwardly upon swinging the upper end of said back mounting link forward from upright to T.V. position, to move the toggle bar forwardly.

3,937,519

MOBILE CHAIR FOR PARAPLEGICS

Raymond Schoolden, 11043 NW. Flagler Terrace, Miami, Fla. 33172

Filed Mar. 25, 1974, Ser. No. 454,615
Int. Cl.² A47C *3/20*
U.S. Cl. 297—347 2 Claims

1. In a wheel chair having:

a chair frame with spaced, opposite sides; means at the front of said frame extending between and rigidly interconnecting said sides;

and front and back wheels operatively connected to the frame at each side to provide a rolling support for the frame;

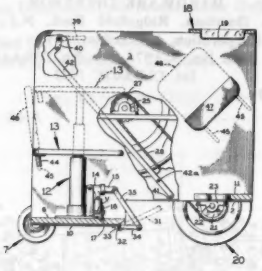
a rigid horizontal platform extending between said sides at the bottom of the frame;

a seat jack mounted on said platform and extending upward therefrom between said sides of the frame, said jack

having an operating member movable between a retracted, lowered position and an extended, raised position; a horizontal seat operatively connected to said operating member of the jack to be vertically raised and lowered while being maintained horizontal;

said chair frame being open at the back between said sides above said platform for the entry and withdrawal of the user to and from the seat at the back of the chair frame;

and mechanical actuator means for the jack operatively coupled at the lower end thereof to said operating member of the jack to selectively control the latter's operation for raising and lowering the seat, said actuator means



extending up from said jack and terminating at the upper end thereof in handle means located for operation by the occupant of said seat;

the improvement wherein said mechanical actuator means comprises:

a first elongated rod-like member operable in one direction for operating said jack to raise the seat, a first handle on the upper end of said first rod-like member;

and a second elongated rod-like member operable in one direction for actuating said jack to lower the seat, and a second handle on the upper end of said second rod-like member.

3,937,520

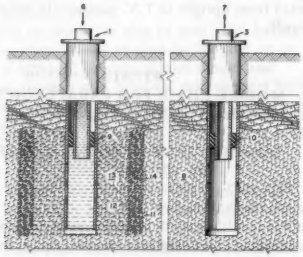
IN SITU MINING USING BACTERIA

John A. Sievert, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 22, 1974, Ser. No. 444,935

Int. Cl.² E21C *43/00*

U.S. Cl. 299—4 **6 Claims**



1. A process for recovering a mineral value from a stratum leachable by a fluid containing a leaching agent comprising:

a. injecting into said stratum to contact said mineral value a medium capable of generating a leaching agent in said stratum, said medium consisting essentially of a carrier fluid, a surfactant and a biological agent;

b. generating said leaching agent by action of said biological agent in situ in said stratum to produce a leaching agent concentration sufficient to leach the mineral value in said stratum;

c. leaching said mineral value with said leaching agent; and

d. displacing and recovering said fluid containing leached mineral value.

3,937,521

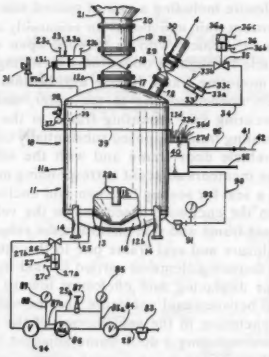
SELF-PURGING PNEUMATIC CONVEYING APPARATUS AND VARIED MEANS OF OPERATION

Brian R. Reuter, Houston, Tex., assignor to Consolidated Engineering Company, Houston, Tex.

Continuation-in-part of Ser. No. 98,567, Dec. 16, 1970, Pat. No. 3,776,599, which is a continuation-in-part of Ser. No. 822,126, May 6, 1969, Pat. No. 3,549,206, which is a continuation-in-part of Ser. No. 686,018, Nov. 28, 1967, abandoned, which is a continuation-in-part of Ser. No. 518,353, Jan. 3, 1966, Pat. No. 3,355,211. This application Dec. 3, 1973, Ser. No. 421,450

Int. Cl.² B65G *53/00*

U.S. Cl. 302—3 **9 Claims**



1. Material transporting apparatus comprising a pressure vessel including a gas permeable diaphragm bridging the lower part of said vessel above the bottom thereof and dividing it into a material plenum thereabove and a gas plenum therebelow, a fill valve controlled inlet conduit to admit flowable material through the top of said vessel into said material plenum to upstand from said diaphragm, vacuum valve means controlling vacuum line communication between the pressure vessel below the diaphragm and the suction side of a vacuum pump, thus to apply vacuum pull through said diaphragm to draw in material from a supply source through an open fill valve in said pressure vessel into said material plenum, air valve means communicating into said pressure vessel below said diaphragm to break the vacuum most briefly at briefly spaced apart intervals, a valve controlled, pressurized gas conduit into said gas plenum, a discharge valve controlled discharge conduit from said plenum, a purge valve controlled by-pass conduit with purge valve disposed in communication with the upper part of said material plenum and to connect into said discharge conduit downstream of said discharge valve, automatically operable means including circuitry sequentially operable to open said fill valve, to open said vacuum valve means, interruptedly to open said air valve means, to close said fill valve means, and said purge valve, also said vacuum valve means, and said air valve means, to open said pressurized gas valve, to open said discharge valve whereby gas pressurized materials are discharged through said discharge conduit, then to start a following handling of a batch of material said circuitry being operable to close said discharge valve, and to open said purge valve, later to open said

fill valve and said vacuum valve means and said air valve means.

3,937,522

APPARATUS FOR CONTINUOUS FEEDING OF GRANULAR MATERIAL WITH SHARP CORNERS TO A CONVEYER PIPE LINE

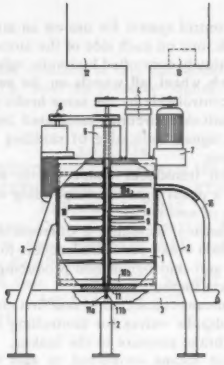
Roland Korn, Nuremberg; Gunter Seyd, and Uwe Paulsen, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 16, 1973, Ser. No. 416,344

Claims priority, application Germany, Nov. 20, 1972, 2256877

Int. Cl.² B65G 53/40

U.S. Cl. 302—56 2 Claims



1. Apparatus for continuously feeding granular material having sharp corners to a conveyor pipe line through which a compressed gas stream carrier flows, said apparatus comprising a vertical cylindrical chamber with a bottom having a central discharge opening connecting with said pipe line and a top having a charging inlet for said material, and means in said chamber for at different levels therein alternately lifting and releasing successive portions of said material therein, the first-named means comprising rotative blades positioned at said different levels and having upper surfaces which are inclined with respect to the rotative direction of said blades, the apparatus including a bottom blade in the bottom of said chamber and which is rotative concentrically with respect to said discharge opening and having side surfaces shaped with respect to this bottom blade's rotative direction to feed said material to said discharge opening, said apparatus having means for stirring said material while it feeds through said discharge opening into said pipe line, said stirring means comprising a rotative vertical spindle having vertical ribs and extending through said discharge opening and into said pipe line, said spindle connecting with a vertical drive shaft extending upwardly and concentrically through said chamber and its top, and said blades being mounted by a tubular shaft encircling said drive shaft and also extending upwardly through said chamber and its top, said shafts extending above said chamber's top, for rotative driving thereof.

3,937,523

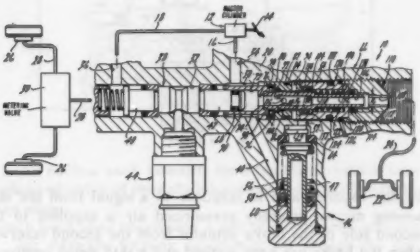
PROPORTIONING BRAKE CONTROL DEVICE WITH BYPASS

David T. Ayers, Jr., Birmingham; Roger E. Doerfler, Detroit, and William Stelzer, Milford, all of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.

Continuation of Ser. No. 393,132, Aug. 30, 1973, abandoned. This application Nov. 29, 1974, Ser. No. 528,475

Int. Cl.² B60T 13/00

U.S. Cl. 303—6 C 31 Claims



1. A device for a dual brake system including a master cylinder and front and rear brake actuators,

said device being located in said system between said master cylinder and said rear brake actuator and including,

a housing having a first bore, a fluid inlet adapted to receive fluid from said master cylinder and a fluid outlet through which fluid is adapted to be displaced to said rear brake actuator, said inlet being communicable with one portion of said first bore and said outlet being communicable with another portion of said first bore,

first valve means actuatable in response to fluid pressure at said inlet in excess of a first predetermined pressure for decreasing the transmission of fluid pressure from said inlet to said outlet,

said first valve means being disposed in a second bore different from said first bore,

second valve means having a first area exposed to the fluid pressure at said outlet and a second area different from said first area exposed to the fluid pressure at said inlet and actuatable in response to a predetermined pressure differential between said inlet and said outlet to provide a flow path circumventing said first valve means and permitting fluid to flow directly from said inlet to said outlet,

said second valve means being disposed in said first bore and movable longitudinally therein to provide said direct flow path, and

bypass means in said first bore for sensing a predetermined pressure condition in an ancillary brake system for providing a direct flow path from said inlet to said outlet and bypassing said first and second valve means.

3,937,524

PNEUMATIC BRAKING SYSTEMS FOR VEHICLES

Brian Ingram, Balsall Common, and Henry Jamieson Riddoch, Solihull, both of England, assignors to Girling Limited, Birmingham, England

Filed Dec. 8, 1972, Ser. No. 313,524

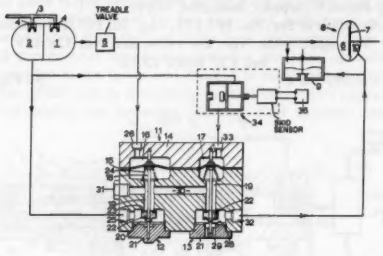
Claims priority, application United Kingdom, Dec. 11, 1971, 57687/71

Int. Cl.² B60T 8/02

U.S. Cl. 303—21 F 14 Claims

1. A pneumatic braking system for vehicles comprising a diaphragm brake actuator, a first reservoir for pressurized air connected through a brake applying valve to one side of the brake actuator for applying the brake, a second reservoir for pressurized air, a normally closed first valve having its inlet connected to said second reservoir, a normally closed second

valve having its inlet connected to the outlet of said first valve and its outlet connected to the second side of said actuator, means for opening the first valve in response to opening of the brake applying valve, skid sensing means, and means for opening the second valve in response to a signal from the skid sensing means, whereby pressurized air is supplied to the second side of the brake actuator from the second reservoir when the brake has been applied and a skid signal received.



3,937,525

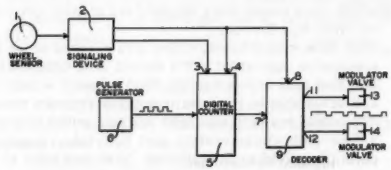
CONTROL SYSTEM PROVIDING A VARIABLE IMPULSE-LIKE BRAKE RELEASE AND/OR REAPPLICATION SIGNAL FOR WHEEL SLIP CONTROL

Dieter Luhdorff; Bernd Oehlerking, both of Hannover; Hugo Jaworsky, Altencelle; Gerhard Koth, Westercelle, and Klaus-P. Simon, Hannover, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Feb. 25, 1974, Ser. No. 445,234

Int. Cl.[2] B60T *8/08*

U.S. Cl. 303—21 P **3 Claims**



1. An anti-wheel skid brake control system for a vehicle comprising:

a signaling means for evaluating the dynamic behavior of a wheel of said vehicle and providing brake pressure release and reapplication signals when certain chosen conditions of wheel rotation have been detected;

b valve means for controlling modulation of fluid brake pressure; and

c control circuit means for providing an impulselike control signal to effect intermittent operation of said valve means in response to either one of said release and reapplication signals being provided, said control circuit means comprising:

i a pulse generator for emitting a predetermined impulse frequency;

ii a digital counter driven in accordance with the impulse frequency of said pulse generator; and

iii decoding means for interrogating the output of said digital counter and emitting said impulse-like control signal so as to vary the duration of respective pulses of said control signal according to different pulse ranges of said impulse frequency, said control signal being characterized by a waveform displaying a predetermined irregular pulse pattern.

3,937,526

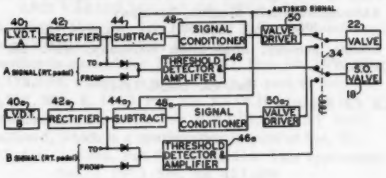
SINGLE VALVE BRAKING SYSTEM HAVING ANTI-SKID CONTROL

Edgar J. Ruof, Akron, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Filed Dec. 16, 1974, Ser. No. 533,248

Int. Cl.[2] B60T *8/00*

U.S. Cl. 303—21 A **6 Claims**



4. A brake control system for use on an aircraft having at least two wheels, one on each side of the aircraft, each wheel having an electrically controlled hydraulic valve connected to a brake for such wheel, all wheels on the same side of the aircraft being controllable by the same brake pedal and each wheel having anti-skid circuitry associated therewith to produce anti-skid signals indicative of skidding activity of the wheel comprising:

a brake pedal transducer connected to each pedal and producing a pedal signal corresponding to the degree of depression of said pedal;

first circuit means, including a differencing circuit, connected to said brake pedal transducers for receiving said pedal and anti-skid signals and producing a brake signal as a function thereof;

valve driver means connected to said first circuit means and to said hydraulic valves for controlling application and release of brake pressure to the brakes;

second circuit means connected to said transducers for opening shut-off valves in hydraulic lines between hydraulic pressure sources and the hydraulic valves to enable such hydraulic valves to regulate brake pressure when either brake pedal has been depressed a fixed amount; and

wherein a level shift circuit is provided for biasing the differencing circuit to superimpose the anti-skid signal on a DC level before the application thereof to the differencing circuit.

3,937,527

FLUID PRESSURE RELAY VALVE

Alfred Eckhart, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany

Filed Sept. 16, 1974, Ser. No. 505,959

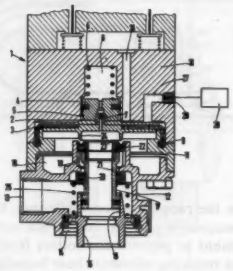
Claims priority, application Germany, Apr. 22, 1974, 2419243; May 25, 1974, 2425449

Int. Cl.[2] B60T *15/20*

U.S. Cl. 303—40 **8 Claims**

1. A fluid pressure relay valve for the electro-pneumatic control of vehicle brakes comprising a housing having a control chamber therein, inlet and outlet solenoid valve means connected to said control chamber for controlling the control pressure therein, a piston displaceable within said control chamber and defining one wall of said control chamber, there being a second chamber on the other side of said piston connected to a braking device, first and second valve means actuable by said piston for venting said second chamber and for connecting said second chamber to a source of pressure medium, and means defining an additional volume of pressure

medium connected to said control chamber for increasing the pressure in said control chamber to a predetermined level by



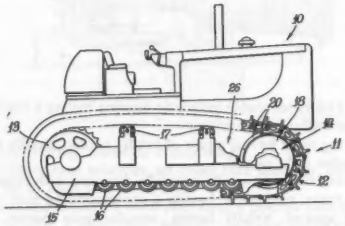
a lowering of the pressure in said additional volume means subsequently to a "hold the pressure" signal.

3,937,528

SEGMENTED AND CUSHIONED IDLER FOR TRACK-TYPE VEHICLES AND METHOD FOR REPAIRING SAME

Donald E. Clemens, Creve Coeur; Donald A. Piepho, Aurora, and Stephen W. Reiss, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 19, 1974, Ser. No. 507,527
Int. Cl.² B60B 3/08
U.S. Cl. 305—21 35 Claims



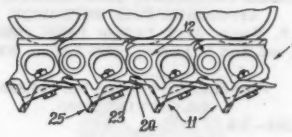
1. In a track-type vehicle of the type having a pair of endless tracks mounted on either side thereof and wherein a forward end of each of said tracks is entrained about an idler disposed for rotation about an axis thereof, the improvement wherein said idler comprises a hub having an annular flange on the periphery thereof, a plurality of arcuate segments circumferentially disposed on said flange about said axis to define a rim having substantially continuous annular bearing surfaces on the periphery thereof and fastening means releasably attaching each of said segments to said hub, said fastening means comprising a plurality of circumferentially spaced bolts extending radially inwardly towards said axis, through each of said segments and threadably attached to said hub.

3,937,529

LOW GROUND PRESSURE TRACK SHOE

Danny J. Becker, Peoria; Roger L. Boggs, East Peoria; Kenneth E. Vaughn, Creve Coeur, and James Richard Shuler, Eureka, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 24, 1974, Ser. No. 517,495
Int. Cl.² B62D 55/24
U.S. Cl. 305—54 23 Claims



1. An endless track assembly for a track-type vehicle comprising a plurality of pivotally interconnected ground engaging track shoes,

each track shoe comprising a pair of downwardly converging sidewalls forming an open-ended, trough-like construction having a V-shaped cross section throughout the entire width thereof, end portions of said sidewalls extending laterally in converging relationships at each lateral end of said track shoe when viewed in top plan,

a common grouser portion formed at lower apex ends of said sidewalls to extend the entire width of said track shoe,

generally horizontally disposed first and second lugs each formed on an upper end of a respective one of said sidewalls to extend the entire width of said track shoe, the first lug of one track shoe overlapping the second lug of an adjacent track shoe in overlapping relationship therewith,

link means disposed intermediate the lateral ends of each of said track shoes and straddling said sidewalls between said first and second lugs,

pivot means pivotally connecting each end of each of said link means to an end of an adjacent link means, and

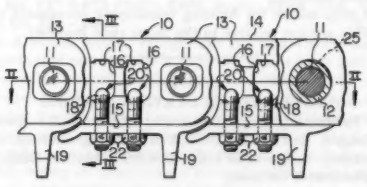
attachment means attaching each of said link means to a respective one of said track shoes.

3,937,530

REVERSIBLE TRACK LINK WITH CLAMPED-ON SHOE

James R. Sturges, Washington, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 30, 1975, Ser. No. 545,449
Int. Cl.² B62D 55/28
U.S. Cl. 305—54 8 Claims



1. A track link assembly for an endless track assembly of a track type vehicle comprising

a track link defining upper and lower rail surfaces hereon, means forming a clamping surface on said track link,

a track shoe disposed on said lower rail surface, and

clamping means engaging said clamping surface for releasably attaching said track shoe to said track link comprising

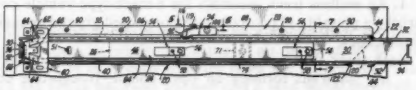
a bolt having a shank thereof extending upwardly through said track shoe and disposed on a side of said track link and an upper clamping end engaging said clamping surface and a nut threadably mounted on a lower end of the shank of said bolt and disposed in abutting relationship with a bottom surface of said track shoe.

3,937,531

TELESCOPING DRAWER SLIDE SECTION FOR 2-MEMBER TELESCOPIC BALL BEARING SLIDES AFFORDING FULL EXTENSION

Magnus F. Hagen, 3713 Twilight Drive, Fullerton, Calif. 92632, and Fred A. Jordan, 14906 Lodosa, Whittier, Calif. 90605

Filed Mar. 3, 1975, Ser. No. 554,536
Int. Cl.² F16C *21/00*
U.S. Cl. 308—3.8 **31 Claims**



1. A telescoping ball bearing slide mechanism, comprising:
an outer slide member of generally channel-shape and having a longitudinally extending bottom wall and oppositely arranged ball races along the side edges of said bottom wall, said ball races being concave in cross section and facing each other;
an inner channel-shape slide member having a longitudinally extending bottom wall and oppositely facing ball races along the side edges thereof, said ball races being concave in cross section and facing outwardly the inner slide member being operably disposed within the outer slide member, said inner slide member being attachable to a part defining a drawer opening;
ball bearings disposed in adjacent races of the respective outer and inner slide members;
a ball retainer operably disposed between the outer and inner slide members for retaining the ball bearings operably in the races;
means for limiting extension of said slide members relative to each other;
means for limiting telescoping of said slide members relative to each other;
a slide section of generally U-shape in cross section comprising a longitudinally extending bottom wall and edge portions along the side edges of said bottom wall, said edge portions being arcuate in cross section and curved about the outer side of the ball races of the outer slide member, said slide section being slidable on the outer slide member;
and stop means for limiting telescoping movement of the slide section relative to the outer slide member.

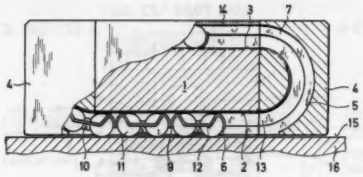
3,937,532

NOVEL RECIRCULATING BEARING

Jorg Fuhrmann, Herzogenaurach; Hartmut Koschmieder, Erlangen, and Georg Schaeffler, Herzogenaurach, all of Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Mar. 21, 1975, Ser. No. 560,952
Claims priority, application Germany, Apr. 3, 1974, 2416198
Int. Cl.² F16C *29/00*
U.S. Cl. 308—6 C **9 Claims**

1. A recirculating roller bearing for the longitudinally moveable mounting of an element on a planar bearing surface comprising a bearing body with at least one straight race section, a return section parallel to the said race section, two preferably semi-cylindrical end deflecting sections connecting the ends of the parallel return section and race section to form a closed circulating track and a plurality of rollers in said circulating track secured by retaining elements between successive rollers, said retaining elements engaging circumferen-



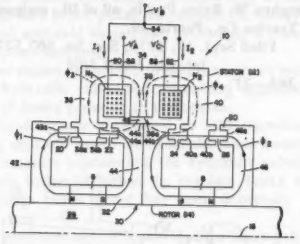
tial grooves in the race shoulders or flanges, the improvement comprising successive pairs of rollers are arranged in a rigid retaining element to prevent the rollers from falling out and the successive retaining elements bear loosely on one another without a mutual connection.

3,937,533

AXIALLY AND RADIALLY CONTROLLABLE MAGNETIC BEARING

Leo Veillette, Lanham, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Feb. 8, 1974, Ser. No. 440,917
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **12 Claims**



1. An axially servoable magnetic bearing having a controllable radial stiffness comprising:
a bearing rotor having a pair of axially spaced, axially facing annular pole pieces;
a bearing stator generally coaxially disposed with respect to the rotor, said stator having a corresponding pair of axially spaced, axially facing, annular pole pieces, each stator pole piece facing an opposite corresponding one of the rotor pole pieces so as to define first and second axially spaced annular axial are gaps between the rotor and stator; and
controllable magnetic flux generating means for independently varying magnetic flux through each of the two airgaps.

3,937,534

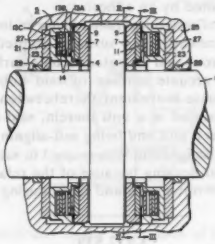
THRUST BEARING RESONANCE CHANGER

William P. Welch, Sunnyvale, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1975, Ser. No. 566,480
Int. Cl.² F16C *17/04, 17/10, 19/04, 1/24*
U.S. Cl. 308—135 **9 Claims**

1. A tilting shoe type thrust bearing having a plurality of tiling shoes disposed in a circular array, each shoe having a

load bearing portion, the improvement comprising a plurality of arcuate spring segments disposed to form an annular ring which provides axial support for said shoes, said annular ring having a plurality of surfaces cooperatively associated and aligned with said load bearing surfaces on the shoes, a plurality of spacers disposed adjacent said annular ring, said spacers



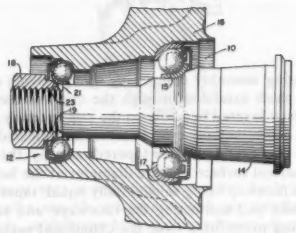
being intermediately disposed with respect to said load bearing surfaces, and on the side opposite thereof thereby equally distributing the load over the array of shoes and reducing the stiffness of said bearing and thus reducing the frequency at which the bearing will resonate when subjected to periodic axial forces during operation.

3,937,535

BEARING WHEEL ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Filed Nov. 5, 1973, Ser. No. 412,712
Int. Cl.² F16C *13/02*
U.S. Cl. 308—191 7 Claims



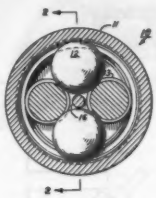
1. A bearing assembly comprising,
an inner race member, an outer race member, and a plurality of balls therebetween,
said race members each providing a central bore for receipt around a shaft and interior concave raceway surfaces facing one another for supporting in bearing contact the plurality of balls, said race members each being formed of steel of substantially uniform thickness and having a Rockwell "C" hardness of from about 50 to about 60, and providing exterior convex surfaces adapted for supporting said race members in juxtaposition to complementary concave surfaces on a hub, said shaft, and a preload nut mechanism, respectively, the thickness of each race member being in the order of not less than 10 percent nor more than 25 percent of the diameter of said balls,
an annular cage element including a plurality of equidistantly spaced pockets, one of each of said plurality of balls being received by each pocket, the dimension of said pockets and said balls being such that opposed surface portions of each ball extend outwardly and inwardly of its retaining pocket, said cage element being received between said race members in order to space said race members by bearing contact of said opposed surfaces of said balls and said raceways,
and a housing means received on one of said race members for retaining the race members, cage and balls as a single assembly.

3,937,536

ROLLING CONTACT BEARING DEVICES

Earl W. Traut, P.O. Box 23776, Fort Lauderdale, Fla. 33307

Filed Nov. 9, 1973, Ser. No. 414,150
Int. Cl.² F16C *23/08*
U.S. Cl. 308—206 19 Claims



1. A rooling device comprising:
a bearing race having at least one circularly oriented surface,
first rotating means,
said first rotating means including at least two rotating elements in rolling contact with said circularly oriented surface of said bearing race,
second rotating means for positioning said first rotating means relative to said circularly oriented surface of said first bearing race,
said second rotating means including at least two generally roller-shaped rotating elements alternately interposed between said rotating elements of said first rotating means to prevent their mutual contact and engaging the same in rolling contact,
and two circular retainer rings respectively engaging the opposite ends of said generally roller-shaped rotating elements in rolling contact and holding the same in position,
said retainer rings also functioning as the only bearing races for said second rotating means.

3,937,537

MOLDED PLASTIC REFRIGERATOR PAN AND WINDOW ASSEMBLY

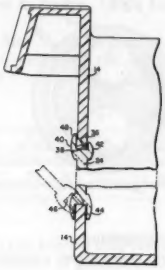
Charles W. Dietterich, Columbus, Ohio, assignor to White-Westinghouse Corporation, Cleveland, Ohio

Filed Feb. 18, 1975, Ser. No. 550,699
Int. Cl.² A47B *88/00*; E05C *21/02*; E06B *1/60*, *3/58*
U.S. Cl. 312—204 5 Claims

1. A plastic molded refrigerator pan and window assembly wherein said pan includes a generally planar front wall having an opening across a substantial area thereof and thereby bounded by opposed upper and lower horizontally extending framing flanges integral with opposed vertical side framing flanges, and a generally transparent molded plastic panel generally coextensive with said opening and including a forwardly facing peripheral bead generally overlapping the edge of said opening and first and second inwardly facing bead means;
said first inwardly facing bead means extending along at least a portion of the bottom of said panel in juxtaposition with opposite portions of said forwardly facing bead to define therebetween a channel at the lower edge of said panel for receipt therein of the edge of the lower framing flange;
said second inwardly facing bead means extending along at least a portion of the top of said panel in juxtaposition

with opposite portions of said forwardly facing bead to define therebetween a channel at the upper edge of said panel; and

tab means extending downwardly from the edge of said upper framing flange, at least in areas generally adjacent each side and generally midway therebetween, said tab means having a downwardly inwardly tapered surface and wherein said middle tab has a height greater than the other of said tab means to the extent that as said panel is inserted by effecting the lower channel and edge engagement and moving said panel to a vertical position by



passing said second inwardly facing bead means through said opening, said bead means and said other of said tab means cooperate to cam said other of said tab means upwardly to permit engagement of said tabs in said upper channel whereas the greater height of said tab adjacent the midway position requires said upper flange to be somewhat manually twisted for sufficient alignment between the upper channel and said tab means for said tab means to be seated within said channel thereby with the release of said twisting force, locking said panel in position.

3,937,538

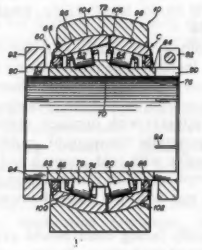
ROLLER BEARING ASSEMBLY

George A. Zimmer; William K. Weidman, and Charles M. Allaben, all of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 393,084, Aug. 30, 1973, which is a division of Ser. No. 267,307, June 29, 1972, abandoned. This application Oct. 7, 1974, Ser. No. 512,644

Int. Cl.² F16C *13/00*

U.S. Cl. 308—207 R **2 Claims**



1. A self-aligning roller bearing assembly for use with a housing adapted to be fixed to a support and with a central opening therethrough to receive said assembly, which opening is defined by an arcuate surface, said roller bearing assembly comprising:

a pair of rows of rollers;

an inner race having a cylindrical opening for receiving and supporting a shaft;

the inner race having a pair of raceways, each having surfaces adapted to contact the rollers of a row; and

an outer race;

said outer race being formed of a pair of substantially like members united by an adhesive;

each member of said outer race having an interior raceway, each said raceway having surfaces adapted to contact the rollers of a row, and an outer arcuate surface adapted to engage the arcuate surface of said housing to permit relative arcuate movement therebetween when said assembly is inserted as a unit therein, said assembly being removable as a unit and being self-aligning to accommodate shaft misalignment with respect to said support when in use in said housing because of the relative movement between said outer race and said housing.

3,937,539

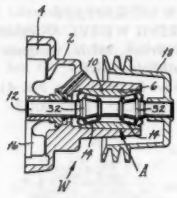
BEARING ASSEMBLY HAVING PRESS-FITTED THRUST RIBS

James Eddie Jones, Canton; William E. Harbottle, North Canton, and Dennis Lee Otto, Malvern, all of Ohio, assignors to The Timken Company, Canton, Ohio

Filed Dec. 19, 1973, Ser. No. 425,982

Int. Cl.² F16C *19/38*

U.S. Cl. 308—214 **15 Claims**



1. A bearing assembly comprising a cup having a tapered raceway; a shaft extended through the cup and having a tapered raceway located opposite to the cup raceway, the shaft also having a substantially cylindrical surface located adjacent to the large diameter end of the tapered raceway, the diameter of the cylindrical surface and the diameter of the large end of the tapered raceway being substantially equal; tapered rollers fitted between and contacting the raceways; and an annular thrust rib ring press-fitted over the cylindrical surface of the shaft and positioned opposite the large diameter ends of the rollers to maintain the rollers in the correct axial position with respect to the shaft.

3,937,540

DEVICE FOR GUIDING THE RELATIVE DISPLACEMENT OF TWO BODIES

Jean-Yves Morizur, Compiegne, France, assignor to Societe Anonyme: Poclain, Le Plessis-Belleville, France

Filed Feb. 18, 1975, Ser. No. 550,724

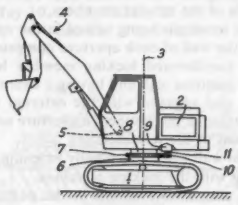
Claims priority, application France, Feb. 26, 1974, 74.06509

Int. Cl.² F16C *19/00*

U.S. Cl. 308—222 **4 Claims**

1. A device for the guidance of two bodies relative to one another, comprising a slide with a female member and a male member contained within the said female member, being supported on the latter, a row of elements for fixing one of the members to one of the bodies and another row of elements for fixing the other member to the other body, whereby those rows are substantially parallel and spaced by a given distance limited by the assembly regulations which must be observed in order to obtain a satisfactory guidance, whereby the fixing

elements of at least one of the said rows each comprises a threaded rod and at least one nut cooperating with the said rod, wherein at the position of each of the said threaded rods a recess is made in the body corresponding to the said row of threaded rods issuing, in order to permit the introduction of the nut or nuts into the recess, into one face of the said body



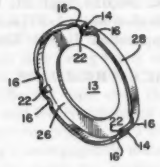
which is perpendicular to the fixing face of the member fixed to the said body, is delimited by a volume of material wherein is provided an orifice issuing into the fixing face and containing the nut or nuts, the said orifice permits the introduction of the end of the threaded rod into the recess but prevents the removal of the nut or nuts from the recess via the fixing face.

3,937,541

THRUST WASHER

Richard Lassen Alling, Winchester, and Richard John Wolten, Torrington, both of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Sept. 16, 1974, Ser. No. 506,239
Int. Cl.² F16C *33/64*
U.S. Cl. 308—235 **6 Claims**



1. A thrust race comprising: a member having a substantially circular outside periphery with an axially extending outer flange, said flange having circumferentially spaced projections with two cutouts for each projections one of said two cutouts located adjacent each side of each projection to facilitate the insertion of another member under the projections.

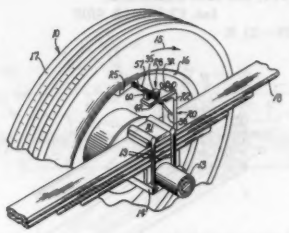
3,937,542

ELECTRICAL BRUSH CONTACT

Hyrum J. Amundsen, Jr., P.O. Box 8411, Fountain Valley, Calif. 92708

Filed Jan. 15, 1975, Ser. No. 541,287
Int. Cl.² H01R *39/00*
U.S. Cl. 339—3 R **5 Claims**

5. In a tire pressure sensing apparatus for use on a vehicle having a wheel rotatably mounted on the vehicle with a contactor mounted on said wheel wherein the sensing device includes an electrical circuit having some components on the rotating wheel and non-rotating components elsewhere on the vehicle; an electrical brush contact adapted to make intermittent contact with the contactor including a plurality of elongated electrically conductive wire bristles disposed in substantially normal relation to the plane of the wheel; a clamp securing together a common end of the bristles; a mounting bracket mounted on said vehicle in spaced relationship to said wheel; a pin disposed on said mounting bracket in substantially parallel relation to the plane of the wheel; a spring circumscribing the pin with one end connected to and supporting the clamp and the other end connected to the non-rotating components disposed to enable the wire bristles to engage the contactor when opposite thereto; and a stop borne by the mounting



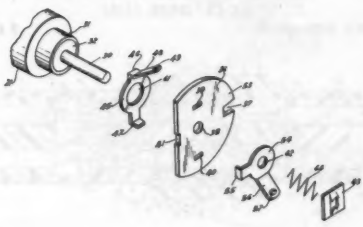
bracket whereby the contactor makes periodic contact with the bristles as the wheel rotates, the spring allowing the bristles to be pivoted in the direction of the contactor motion and the stop serving to limit spring motion in the opposite direction.

3,937,543

ELECTRICAL SWIVEL CONTACT ASSEMBLY

Patrick M. Tomaro, Maplewood, N.J., assignor to Continental Hair Products, Inc., Edison, N.J.

Filed Jan. 29, 1975, Ser. No. 545,055
Int. Cl.² H01R *39/00*
U.S. Cl. 339—6 R **10 Claims**



1. An electrical swivel contact assembly comprising:
a. a support plate having a hole,
b. two electrical contact members, one of said contact members being arranged against each face of said support plate, and each of said contact members having a hole aligned with the holes in said support plate and the other contact member,
c. a power cord terminal having an electrically-conductive pin surrounded by an electrically-conductive ring, said pin and ring being electrically insulated from each other, and said pin projecting beyond said ring and through the aligned holes in said support plate and contact members, and
d. resilient means for pressing said ring against one of said contact members and for electrically connecting said pin to the other of said contact members.

3,937,544

ELECTRIC CURRENT SUPPLY CONDUIT AND A METHOD AND A DEVICE FOR PROVIDING SAME

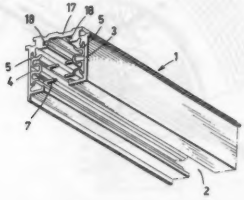
Rainer Ilkka Tapio Valtonen, Soukka, Espoo, Finland, assignor to Oy Nokia AB, Helsinki, Finland

Filed Feb. 22, 1973, Ser. No. 334,883

Claims priority, application Finland, Dec. 15, 1972, 3555/72. The portion of the term of this patent subsequent to Aug. 20, 1991, has been disclaimed.

Int. Cl.[2] H01R 9/00

U.S. Cl. 339—21 R 10 Claims



1. An electric current supply arrangement comprising, in combination, a metal support rail forming an open longitudinal channel and longitudinally extending current conductors fixed in their longitudinal direction fastened at the support rail, and a coupling element removably inserted in the end of the support rail to make contact between contact fingers of the element and the ends of the current conductors, the ends of said current conductors being bent perpendicularly to the longitudinal direction of said conductors so as to extend parallelly towards each other.

3,937,545

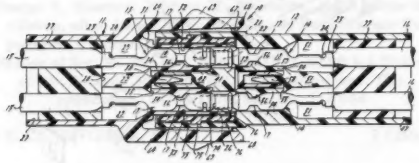
WATERPROOF ELECTRICAL CONNECTOR

Thomas M. Cairns, Birmingham, Mich., and Ronald F. Froats, Windsor, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Filed Dec. 23, 1974, Ser. No. 535,924

Int. Cl.[2] H01R 13/52

U.S. Cl. 339—60 R 5 Claims



1. A separable waterproof electrical connector for a plurality of pairs of axially interconnectable cylindrical electrical terminals coupled to the ends of insulated wires,

each terminal having an annular external recess in its cylindrical peripheral surface,

the connector comprising:

a pair of elongated, rigid nonconductive elastomeric, tubular members having generally complementary end portions, fitted one into the other,

a soft elastomeric sealing sleeve concentrically interposed between the interengaged end portions to prevent the passage of moisture therebetween,

the soft elastomeric sleeve having an external retention ring engageable with a groove in one of the tubular members to hold the sleeve in place in the one member upon axial separation of the tubular members,

and a plurality of internal and external integral circumferential sealing rings on the sleeve compressible between the abutting tubular member surfaces,

releasable clamping means on the exterior of the tubular member end portions holding the latter in engagement,

each elastomeric tubular member having an interior partition wall extending laterally of its longitudinally axis in juxtaposition to the interengaged end portions thereof,

each partition wall having a plurality of axially extending apertures therethrough equally spaced around the longitudinal axis of the tubular members,

the electrical terminals being seated in the apertures,

a portion of the wall of each aperture comprising an axially extending cantilevered locking member hinged at one end to the partition wall and having a detent spaced from its hinged end engaged with the external recess on the terminal seated in the respective aperture to prevent axial displacement of the terminal,

each partition wall having an axially extending cavity communicating with the locking members,

displaceable plug means seated in the partition cavity in abutting relation to the locking members to hold the detents on the latter in the respective terminal recesses, and

grommet means seated in the tubular member outwardly of the partition wall through which the insulated wires extend,

the grommet means being in watertight engagement with the interior walls of the tubular members and the insulated wires.

3,937,546

MULTIWAY CONNECTOR FOR A PRINTED CIRCUIT BOARD

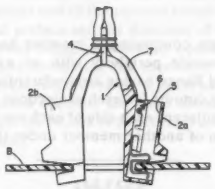
Antony Brasher Clewes, Sherwood, and Denis William Tuckwood, Beeston, both of England, assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 291,020, Sept. 21, 1972, Pat. No. 3,850,493. This application Mar. 4, 1974, Ser. No. 447,755

Claims priority, application United Kingdom, Sept. 24, 1971, 44757/71

Int. Cl.[2] H01R 13/62

U.S. Cl. 339—61 R 20 Claims

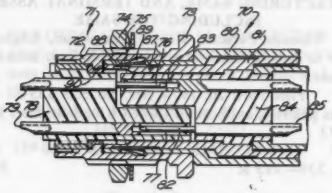


1. In combination, a printed circuit board having opposed edge portions and face portions and the face portions having conductors thereon; and a multiway connector comprising a body portion of an electrically insulative material having two board-engaging portions moveable relative to one another in a direction generally parallel to the plane of the printed circuit board, and receiving therein respective edge portions of the board, and a plurality of contact members mounted in the body portion of the connector and comprising contact making portions extending to the board-engaging portions and each contact making portion having opposed spaced apart limbs on each side of the board and at least one of the limbs in engagement with the conductors on at least one face portion of the board.

3,937,547
CONNECTOR PORTION HAVING RELEASABLE FASTENING MEANS

Kenneth William Lee-Kemp, Ragstones, The Vine, Sevenoaks, Kent, England

Filed May 3, 1974, Ser. No. 466,773
Claims priority, application United Kingdom, May 8, 1973, 21928/73; May 10, 1973, 53514/72
Int. Cl.² H01R 13/54
U.S. Cl. 339—74 R **6 Claims**



1. In a quick-release connector having interengageable male and female connector portions, said male connector portion including an outer shell having openings therethrough, an inner shell concentric with said outer shell and having external recesses therein, and a plurality of spring catches, each of said catches having a portion projecting through a respective one of said openings in said outer shell for locking engagement with said female portion, and said outer shell being axially slidable relative to said inner shell to deflect said portions of said catches to cause disengagement from said female connector portion, the improvement comprising the provision of a plurality of separately formed spring catches which are independent of each other and of said inner shell, each of said spring catches being located in a recess in said inner shell, each of said catches being in the form of a flat strip of resilient material, and each strip being freely supported at its ends in said recess in said inner shell whereby, when said portion of each catch is deflected, said strip thereof is deformed by bowing between said freely supported ends.

4. A male connector portion for a quick release connector of the type having interengageable male and female connector portions, said male connector portion comprising an outer shell having openings therethrough, an inner shell concentric with said outer shell and having a locating recess in the outer surface thereof, and a plurality of spring catches, said catches each being formed as a flat sheet of resilient material, each catch being defined by an uplifted detent portion bounded at least at opposite sides thereof by axially extending base portions, each detent portions projecting through a respective one of said openings for locking engagement with a female portion, and said outer shell being axially slidable relative to said inner shell for deflecting said detent portions of said catches inwardly to cause disengagement of said detent portions from a female connector portion, said base portion of each of said spring catches being transversely arcuately configured to accommodate the curvature of said locating recess in said inner shell, said detent portions also being transversely arcuately configured with a smaller radius of curvature than that of said base portions whereby said detent portions resist said deflection.

3,937,548
DEVICE FOR SPLICING WIRE

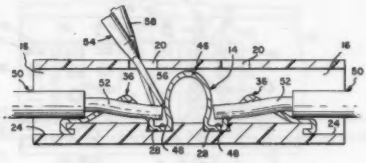
Larry Eugene Dittmann, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 26, 1975, Ser. No. 553,389
Int. Cl.² H01R 11/04
U.S. Cl. 339—95 D **1 Claim**

1. A device for electrically splicing two conductors together, which comprises:

a. a housing of insulating material and having an opened passageway throughout its length, said passageway floor having a pair of spaced apart slots;

b. a contact strip stamped and formed from a conductive material positioned in the passageway, said strip having a centrally disposed spring member and a pair of generally triangular shaped frames, one on either side of the spring member with a depressed step inbetween; and

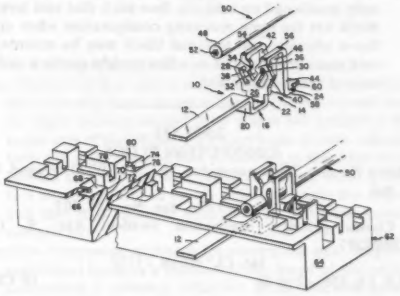


c. apertures located in each wall defining said frames, said contact strip adapted to receive a wire in each frame and upon forcing the steps into the slots with the spring member removably retaining such therein, the apertures are deformed with the edges thereof gripping the conductors thereby achieving an electrical splice between the two wires.

3,937,549
STRIMP

Donald Kent Hughes, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 18, 1974, Ser. No. 480,986
Int. Cl.² H01R 13/38
U.S. Cl. 339—97 C **17 Claims**



1. An electrical contact comprising:

a metallic member having a conductor engaging portion and a mateable contact engaging portion,

said conductor engaging portion comprising a base, a pair of spaced beam members extending from said base, a protrusion near the free end of each said beam member directed towards the protrusion on the opposite beam member, said protrusions and beam members defining therebetween an arrow head shaped slot, and a pair of arched legs, each leg connected between said base and the free end of one of said beam members to define therewith a quadrilateral whereby said beam members are held together against resilient deflection away from a conductor inserted into said slot by substantially straightening said arched legs to form a triangle with said base and beam members.

3,937,550

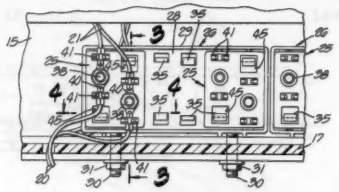
SNAP-IN, SNAP-OUT TERMINAL BLOCK AND MOUNTING MEMBER THEREFOR

George W. Gillemot, Santa Monica, Calif., assignor to John T. Thompson, Los Angeles, Calif., a part interest

Filed Apr. 29, 1974, Ser. No. 465,073

Int. Cl.[2] H01R 9/00

U.S. Cl. 339—198 G 3 Claims



1. A terminal block having a foursided generally cubical main body of non-conductive material,

a pair of threaded studs fixed thereto and projecting from one face thereof adjacent a respective diagonally related first pair of corners of said main body,

a pair of openings through said main body positioned inwardly of the sides thereof and adjacent a diagonally related second pair of corners of said main body,

said openings each having a detent surface below said one face and facing outwardly and adapted to seat a latching tang entering the opening from the face opposite said one face to hold said terminal block detachably assembled with said oppposite face snugly against a mounting member for said terminal block, and

nut means on each of said threaded studs for holding a conductor assembled to each of said studs,

said pair of studs and said pair of openings being symmetrically positioned on said one face such that said terminal block has the same mounting configuration when upside down whereby said terminal block may be mounted on said mounting member in a first upright position and in a second reversed position.

3,937,551

CONNECTION BLOCK

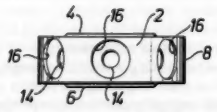
Harry Persson, Färjemansgatan 15A, 831 00 Ostersund, Sweden

Filed Apr. 4, 1974, Ser. No. 457,703

Claims priority, application Sweden, Apr. 9, 1973, 73049397

Int. Cl.[2] H01R 13/50

U.S. Cl. 339—210 M 10 Claims



1. A connection block comprising an insulating housing,

said housing defining a plurality of apertures around the peripheral edge portions thereof,

a plurality of mutually interconnected sleeve-shaped contact means enclosed by said housing and each positioned and adapted to receive a pin-shaped contact element through one of said plurality of apertures in said housing,

said plurality of interconnected contact means being integrally formed together by two abutting conductive sheets having respectively opposed grooves to define individual sleeveshaped contact means,

said housing comprising two cover-shaped parts,

said cover-shaped parts each including pressure means between the inside portion of each of said cover-shaped parts and the adjacent conductive sheet for maintaining said conductive sheets pressed against each other.

3,937,552

TERMINAL INSULATOR METHOD OF MANUFACTURING SAME, AND TERMINAL ASSEMBLY INCLUDING THE SAME

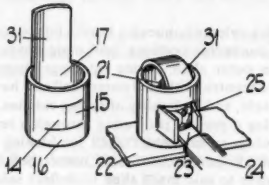
William Thomas Parsons, Hemel Hempstead, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Nov. 20, 1974, Ser. No. 525,635

Claims priority, application United Kingdom, Dec. 1, 1973, 55805/73

Int. Cl.[2] H01R 13/44; H01B 19/00

U.S. Cl. 339—213 R 3 Claims



1. A terminal insulator comprising a tubular component formed from flexible insulating tube, the wall of one axial region of said tubular component being formed with slits which define therein a displaceable flap such that displacement of the flap relative to the remainder of the component produces in said axial region an aperture and the remainder of said region defines a shroud, said component including a further axial region which is unaffected by said slits and so defines an unbroken collar, and said component further including an integral flexible strip which extends axially from the axial end of the component remote from the unbroken collar, the strip being of a length and width such that it can be folded over relative to the component to substantially close said axial end of the component.

2. A method of manufacturing a terminal insulator comprising starting with a length of flexible, insulating tube, and forming in one axial region of the wall of the tube slits which define between them a displaceable flap, which, when displaced, leaves in the wall of the tube an aperture such that the remainder of said axial region defines a shroud, the slits being so positioned that a further axial region of the tube is unaffected by the slits, and so defines an unbroken collar, and, removing part of the wall of the tube at the axial end thereof remote from said unbroken collar so as to leave, extending axially from said axial end of the tube, a flexible strip the length and width of which are such that the strip can be folded to substantially close said axial end of the tube.

3. A terminal assembly including a base, a terminal post upstanding from the base, a connector engaged with the terminal post and extending generally at right angles to the terminal post, and an insulator comprising a tubular component formed from flexible insulating tube, the tubular component having one axial region of the wall thereof formed with slits which define a displaceable flap such that displacement of the flap relative to the remainder of the component produces in said axial region an aperture, and the remainder of said region defines a shroud, said component including a further axial region which is unaffected by said slits and so defines an unbroken collar, and said component having an integral strip extending axially from the axial end of the component remote

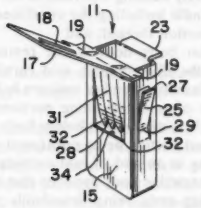
from the unbroken collar, said flap being displaced to lie generally parallel with the connector, the connector extending through said aperture, and the collar encircling said terminal post and being trapped between the connector and the base so as to retain the insulator in position relative to the terminal post and connector, said shroud shrouding the periphery of the terminal post and the connector, and said strip being folded to overlie the top of the terminal post, the length and width of the strip being such that the strip, when so folded, substantially closes said axial end of the insulator component.

3,937,553

ELECTRICAL TERMINAL CONNECTOR

Paul A. Maximoff, Schaumberg, and Albert P. DeVito, Glenview, both of Ill., assignors to Palmer Industries Ltd., Chicago, Ill.

Filed Nov. 13, 1974, Ser. No. 523,318
Int. Cl.² H01R *13/12*
U.S. Cl. 339—258 R **5 Claims**



1. A terminal connector for securing electrical lead wires to a base board having opposite surfaces and having apertures extending through the body for accommodating the connector, the connector comprising, a hollow body substantially in rectangular tubular form having opposing sides and ends, the body being open at one end thereof for receiving wires and a substantially closed opposite end to provide a stop for wires, a plurality of gripping tines positioned substantially on a same plane extending from a side surface of the rectangular body and extending in converging cantilever relation toward the opposite side surface and away from the opening, the converging ends of the tines positioned adjacent the opposite side surface to firmly engage wires inserted into said body, flanges extending from the body arranged to engage one surface of the base board adjacent the aperture to position the terminal connector, resilient cantilever lugs each having an end affixed to said body and the opposite end extending outwardly from said body toward the flanges to engage with the opposite surface of the base, the lugs each having an elbow portion extending into the interior of the body, which elbow portion is capable of being pushed outwardly and upwardly from the interior of the body and thereby urge said outwardly and upwardly extending end of the lugs to firmly abut and engage base boards of varying thicknesses.

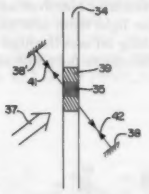
3,937,554

HOLOGRAMS IMPREGNATED WITH LASER ACTIVE MATERIAL

Yoshito Tsunoda, Tokyo, and Yasutsugu Takeda, Kokubunji, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 26, 1973, Ser. No. 400,725
Claims priority, application Japan, Sept. 29, 1972, 47-97057
Int. Cl.² G03H *1/22*
U.S. Cl. 350—3.5 **21 Claims**

1. In a hologram recording apparatus, wherein an object beam spatially modulated with object information and a reference beam are directed upon a prescribed portion of a hologram recording medium to form a hologram of said information therein, said hologram being maintained within said hologram recording medium, the improvement wherein at least said prescribed portion of said hologram recording medium is



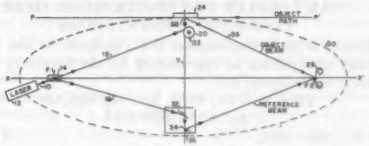
impregnated with a laser active material which is different from the material of which said hologram recording medium is made.

3,937,555

HOLOGRAPHIC MOTION PICTURE CAMERA WITH DOPPLER SHIFT COMPENSATION

Robert L. Kurtz, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 17, 1974, Ser. No. 506,804
Int. Cl.² G03H *1/14, 1/04*
U.S. Cl. 350—3.5 **2 Claims**



1. In a holographic motion picture camera wherein:
an elliptical optical system is employed to provide an object beam passing from a beam splitter at one focus point onto an object moving tangent to an ellipse and parallel to the major axis of the ellipse; the object beam is then reflected from the object onto a film positioned at the other focus point; a reference beam is projected from a beam splitter to a mirror positioned on the ellipse opposite the object, and then it is reflected onto the film, the improvement comprising:
motion compensation means for varying the path length of said object beam as a function of the speed of said object comprising a rotating reflective drum inserted in the object beam path between said beam splitter and an object, and
optical means positioned in the reference beam path between said beam splitter and said film for extending the optical distance of the reference beam path a distance equal to the extension of distance provided by said motion compensation means.

3,937,556

VIEWING FIELD SPLITTER

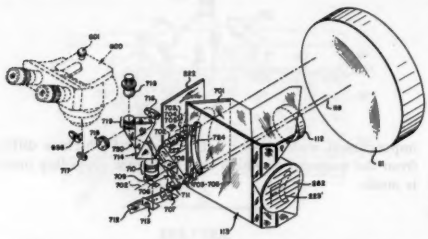
William H. Newell, Mount Vernon, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 26, 1974, Ser. No. 509,587
Int. Cl.² G02B *21/18;* G01B *11/24*
U.S. Cl. 350—30 **4 Claims**

1. Apparatus for simultaneously viewing two points located on an illuminated circular arcuate area of an object comprising:

a. first and second microscope objectives supported for viewing points on said arcuate area of the object

b. first and second periscopes coupled respectively to each of said first and second objectives and supported in position to deflect the light from said points passed through said objectives along an axis through the center of curvature and perpendicular to the plane of said arcuate area,



c. means mounting said objectives and periscopes for swinging each coupled objective, periscope pair independently of the other, about said axis while maintaining the periscopes in proper orientation to deflect said light along said axis, and

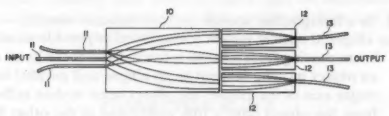
d. means to present in a common eyepiece one-half the field of each of said objectives.

3,937,557

STAR COUPLER FOR SINGLE MODE FIBER COMMUNICATION SYSTEMS

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,538
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 1 Claim



1. A coupler for a multiterminal fiber optic communication system which comprises:

a large constant diameter cylindrical, elongated, lens having a light focusing end and light collimating end,

a plurality of small constant diameter cylindrical, elongated, lenses each containing a light focusing end and a light collimating end each secured in end-to-end relationship in optical alignment with said large diameter lens in parallel relationship with each other with said collimating end of said small diameter lenses adjacent said collimating end of said large diameter lens for receiving collimated light therefrom,

whereby radiation from a plurality of fiber optic transmission lines incident on the focusing end of said large diameter lens is scrambled together along the length thereof and directed into collimated light at the collimated end thereof, and

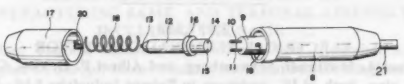
each of said plurality of small diameter lenses receive a portion of the radiation scrambled by said large diameter lens on their light collimating end and focuses the received scrambled radiation along their length to a point at their focusing end for transmission over separate single optic fiber transmission lines connected to the focusing end thereof.

3,937,558

OPTICAL FIBER LIGHT PEN

Kunihiko Mukai, and Kikuo Ikeda, both of Tsu, Japan, assignors to Nippon Glass Fiber Co., Ltd., Japan

Filed Dec. 4, 1973, Ser. No. 421,660
Claims priority, application Japan, Dec. 13, 1972, 47-125095
Int. Cl.² G02B 5/14
U.S. Cl. 350—96 B 8 Claims



1. A light pen containing a photon-conductive fiber bundle, the bundle being bifurcated at one end and combined at the other end, comprising,

a. a cartridge body housing a portion of the photon-conductive fiber bundle including the combined end and a first bifurcated portion thereof, and

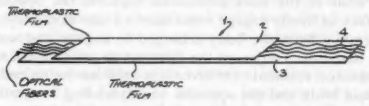
b. a pen holder body housing the remaining bifurcated portions of the fiber bundle, said cartridge body being detachably fixed to an end of said pen holder body, a plug end of each of said remaining portions projecting out from an end face of said pen holder body, the ends of said first bifurcated portion being positioned in corresponding holes opening at an end of said cartridge body opposite that of said cartridge body opposite that of said combined end, said plug ends being detachably received in said corresponding holes.

3,937,559

OPTICAL FIBER CABLE

Antonio Ferrentino, and Germano Beretta, both of Monza (Milan), Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed May 1, 1974, Ser. No. 465,827
Claims priority, application Italy, May 23, 1973, 24442/73
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 WG 9 Claims



1. A composite optical fiber band comprising at least a pair of films of synthetic thermoplastic material which are sealed together and have a plurality of light transmitting optical fibers embedded therebetween, said fibers following undulate paths, the lengths of which do not exceed the lengths of the films in which the fibers are embedded by more than 10 percent so that the fibers are subjected to little stress when the films are subjected to tension and bending stresses within the elastic limits of the films.

3,937,560

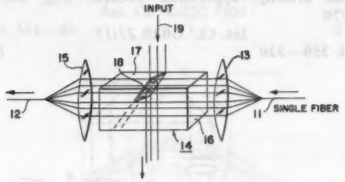
SINGLE FIBER ACCESS COUPLER

A. Fenner Milton, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 29, 1974, Ser. No. 528,539
Int. Cl.² G02B 5/16
U.S. Cl. 350—96 C 2 Claims

1. A system for coupling radiation on and off of a single optic fiber data transmission line while allowing a portion of the radiation to be transmitted into a single optic fiber for transmission, which comprises:

a first lens for expanding and collimating incident radiation from a single optic fiber transmission line;
a second lens for collimating and focusing collimated radiation into the end of an optic fiber data transmission line;
a rectangular block of optically transparent material positioned between said first and second lens in optical alignment therewith;



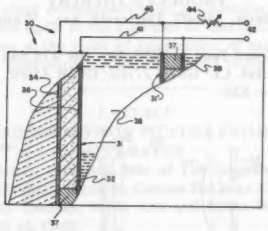
said rectangular block including a reflective surface therein at a 45° degree angle with respect to incident optical radiation;
whereby said reflective surface reflects a portion of the radiation incident on said reflective surface out of said rectangular block normal to incident radiation and said reflective surface reflects input radiation onto said second lens and into the end of said single optic fiber data transmission line.

3,937,561

LIQUID CRYSTAL OPTICAL IMAGE ATTENUATOR

Donald W. Peterson, and Werner G. Hueber, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 2, 1974, Ser. No. 528,746
Int. Cl.[2] G02B *5/17*; G02F *1/13*
U.S. Cl. 350—96 BC **7 Claims**



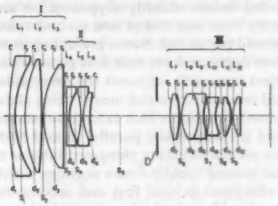
1. An electro-optical image attenuator device comprising:
A. a plurality of serially arranged nematic liquid crystal films of the type that exhibits dynamic scattering when an electric current is caused to flow therein;
B. conductive means associated with each said film for applying a current producing voltage in parallel to each said film; and
C. a coherent fiber optic plate adjacent to and following each said film and being composed of a plurality of closely spaced substantially parallel optic fibers orthogonal to said film.

3,937,562

THREE-COMPONENT VARIFOCAL OBJECTIVE

Trude Muszumanski, and Irmgard Wendisch, both of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Oct. 15, 1973, Ser. No. 406,291
Claims priority, application Austria, Oct. 16, 1972, 8859/72
Int. Cl.[2] G02B *15/00*, *9/60*
U.S. Cl. 350—184 **16 Claims**



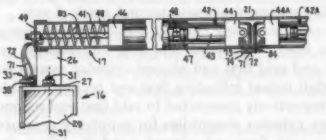
1. A varifocal objective consisting of:
an axially shiftable positively refracting front component;
an axially shiftable negative refracting intermediate component; and
an axially fixed positively refracting rear component constituted by five closely air-spaced lens members, namely a positive first lens member, a positive second lens member, a negative third lens member, a positive fourth lens member and a positive fifth lens member, the spacing of said intermediate component from said rear component in a position of maximum overall focal length substantially exceeding any air space between said lens members while being substantially smaller than in a position of minimum overall focal length, said front component consisting of a forwardly convex negative meniscus L_1 followed by a biconvex lens L_2 and a substantially planoconvex lens L_3 with forwardly facing convexity, said second component consisting of a substantially planoconcave lens L_4 rearwardly facing concavity followed by a biconcave lens L_5 cemented onto a positive meniscus L_6, said first lens member of said rear component being a biconvex lens L_7, said second lens member consisting of a biconvex lens L_8 cemented to a biconcave lens L_9, said third lens member being a biconcave lens L_{10}, said fourth lens member being a biconvex lens L_{11}, and said fifth member being a substantially planoconvex lens L_{12} with forwardly facing convexity.

3,937,563

REMOTE CONTROLLED MIRROR ASSEMBLY FOR VEHICLE

Donald A. Frabe, 72nd St., Rte. 3, South Haven, Mich. 49090

Filed Mar. 21, 1974, Ser. No. 453,219
Int. Cl.[2] G02B *5/08*
U.S. Cl. 350—289 **5 Claims**



4. A remote controlled mirror system for attachment to the roof of a vehicle, such as a truck, comprising:
frame means adapted to be fixedly connected to the roof of a vehicle;

first double-acting fluid pressure cylinder means including a first elongated cylinder housing fixedly mounted on said frame means and first elongated piston rod means slidably supported on and extending outwardly from one end of said first cylinder housing, said first piston rod means being positioned to project outwardly from one side of the vehicle and being slidably movable in a first direction which extends substantially horizontally;

a second double-acting fluid pressure cylinder means including a second elongated cylinder housing fixedly mounted on said frame means and second elongated piston rod means slidably supported on and projecting outwardly from one end of said second cylinder housing, said second piston rod means projecting outwardly in the direction opposite from said first piston rod means so as to project outwardly adjacent the other side of the vehicle, said second piston rod means being slidably movable in a second direction which extends substantially horizontally and is substantially parallel to said first direction;

said frame means including elongated tubular means having first and second tubular frame portions which are respectively elongated in said first and second directions and open outwardly towards the opposite sides of the vehicle, the first and second cylinder housings being respectively fixedly positioned within the first and second tubular frame portions;

first and second slide means fixedly connected respectively to said first and second piston rod means for slidable movement in said first and second directions, respectively;

said first slide means including a first tubular slide member which is elongated in said first direction and has an inner end portion thereof disposed in surrounding and slidable telescopic relationship to said first cylinder housing, the inner end portion of said first tubular slide member also being slidably telescoped within said first tubular frame portion, said first tubular slide member surrounding said first piston rod means, the outer end portions of said first tubular slide member and said first piston rod means being fixedly connected;

said second slide means including a second tubular slide member which is elongated in said second direction and has an inner end portion thereof disposed in surrounding and slidable telescopic relationship to said second cylinder housing, the inner end portion of said second tubular slide member also being slidably telescoped within the second tubular frame portion, said second tubular slide member surrounding said second piston rod means, the outer end portions of said second tubular slide member and said second piston rod means being fixedly connected;

first and second mirror assemblies respectively mounted on said first and second tubular slide members adjacent the outer ends thereof for angular movement about first and second substantially vertical axes, respectively;

a first fluid pressure cylinder assembly mounted adjacent and drivingly connected to said first mirror assembly for selectively angularly moving same relative to said first slide means about said first vertical axis;

a second fluid pressure cylinder assembly mounted adjacent and drivingly connected to said second mirror assembly for selectively angular moving same relative to said second slide means about said second vertical axis;

power means, including conduit means, for supplying pressurized fluid to each of said first and second cylinder means and said first and second cylinder assemblies;

said conduit means including first and second flexible conduits respectively connected to said first and second fluid pressure cylinder assemblies for supplying pressure fluid thereto, said first and second conduits being disposed within and extending along said first and second tubular slide members, respectively; and

control means operatively associated with said power means for permitting independent activation of each said cylinder means and each said cylinder assembly.

3,937,564

METHOD FOR TRIMMING OF A SPECIMEN FOR A MICROTOME

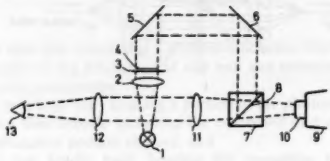
Karl Göran Algy Persson, Stockholm, Sweden, assignor to LKB-Produkter AB, Bromma, Sweden

Continuation of Ser. No. 170,943, Aug. 11, 1971, abandoned. This application June 4, 1973, Ser. No. 366,663

Claims priority, application Sweden, Aug. 28, 1970, 11784/70

Int. Cl.[2] G02B *21/18*

U.S. Cl. 350—320 **1 Claim**



1. Method of trimming a specimen for sectioning by a microtome comprising the steps of cutting a thin, partly transparent section from said specimen, removing said partly transparent section from said specimen, treating said partly transparent section to provide a contrasting image of a small specimen area of interest, illuminating said partly transparent section and the surface of the specimen from which said section has been cut, providing an optical path, one portion of which extends through said partly transparent section, for simultaneously viewing optically superimposed images of said illuminated partly transparent section and the surface of the specimen from which said section has been cut in a beam combining microscope to identify the location of the small specimen area of interest on the surface of said specimen by reference to the corresponding visible location on said partly transparent section, and further trimming said specimen by reference to said superimposed images.

3,937,565

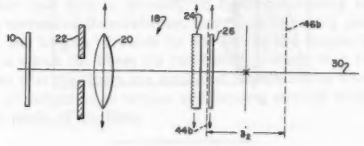
PROCESS OF CODING INDICIA AND PRODUCT PRODUCED THEREBY

Alfred V. Alasia, 146-07 Thirteenth Ave., Whitestone, N.Y. 11357

Filed June 3, 1974, Ser. No. 475,951

Int. Cl.[2] G02B *27/00*; G03B *35/00*

U.S. Cl. 350—320 **14 Claims**



1. A process of producing with an autostereoscopic camera having a lens and a lenticular screen which are movable relative to one another in such manner as to form a parallax panoramogram in a combined image plane, a coded or unscrambled form from an original pattern, said process comprising the steps of:

forming an image of said original pattern in said combined image plane of said lens and screen;

spacing a photosensitive element away from said image plane but within the depth of focus provided by said screen and the effective lens aperture of said camera;

exposing the spaced photosensitive element to said image while in the course of said relative movement.

3,937,566

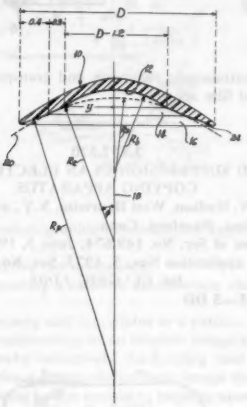
PROCESS FOR PRODUCING CONTACT LENSES

Malcolm G. Townsley, Park Ridge, Ill., assignor to Wesley-Jessen Inc., Chicago, Ill.

Continuation of Ser. No. 232,040, March 6, 1972, abandoned, which is a continuation of Ser. No. 3,945, Jan. 19, 1970, abandoned. This application Feb. 27, 1974, Ser. No. 446,399

Int. Cl.² G02C 7/04

U.S. Cl. 351—40 **3 Claims**



1. A method of making a contact lens for the eye of a patient, said lens defining an optical zone and a surrounding bearing zone, comprising the steps of; measuring the eye of said patient to obtain a base curve and the slope of the cornea of the eye at at least one point in the area to be covered by said bearing zone of said lens, forming a first concave curvature on the interior face of said lens, said first curvature conforming to a portion of a sphere having a radius equal to the radius of said base curve, and forming a second concave curvature on the interior face of said lens to provide a bearing zone, said second curvature corresponding to the annulus of a sphere having a chord equal to the diameter of said optical zone and having a slope at the point of intersection of said chord and said annulus conforming to said measured slope.

3,937,567

CONTINUOUS MOTION PICTURE PROJECTOR APPARATUS

Richard Thomas, deceased, late of Los Angeles, Calif., by Betty M. Thomas, executrix, Corona Del Mar, Calif., assignors to Betty Thomas, Santa Ana and Helen Hansen, Long Beach, both of, Calif.

Filed Mar. 29, 1974, Ser. No. 456,002

Int. Cl.² G03B 31/02

U.S. Cl. 352—27 **6 Claims**

1. A continuous motion picture projection apparatus comprising:

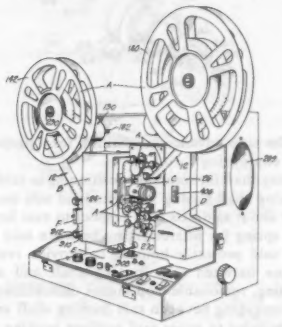
a. an elongated film strip having imprinted thereon first and second image tracks, each comprising a series of sequential photographic images;

b. a supporting structure having a base portion and a central mounting partition;

c. illumination means pivotally mounted on said mounting partition on one side of said film strip and movable from a first position to a second position, including a lamp and a cooperating condensor lens so constructed and arranged as to direct rays of light through the photographic images of said first image track when said illumination means is in its first position and through said second image track when said illumination means is in its second position;

d. a projection lens pivotally mounted on said partition on the other side of said film strip and movable from a first position of coaxial alignment with said condensor lens in its first position to a second position of coaxial alignment with said condensor lens in its second position;

e. drive means carried by said supporting structure for moving said film in a first and second direction between said condensor lens and said projection lens so that the light passing through said condensor lens will pass through the images imprinted on said film, said drive means comprising:



1. a rotatable drive shaft;
2. reversible motor means for rotatably driving said drive shaft; and
3. film feed means operably coupled with said drive shaft and adapted to engage said film to move it between said condensor lens and said projection lens;

f. a first friction clutch means carried by said drive shaft for moving said illumination means alternately from its first position to its second position upon change of direction of rotation of said drive shaft said first friction clutch means comprising:
1. a driven disc carried by said drive shaft and rotatable relative thereto;
2. a link element pivotally connected at one end to said driven disc and connected at its other end to said illumination means;
3. a driver disc carried by said drive shaft and rotatable therewith; and
4. a friction disc interposed between said driver and driven discs to transmit rotational forces to said driven disc upon the change of direction of rotation of said drive shaft;

g. a second friction clutch means carried by said drive shaft for moving said projection lens from its first position to its second position upon a change of direction of rotation of said drive shaft said second means comprising:
1. a clutch member carried by said drive shaft and rotatable with respect thereto;
2. a clutch shoe carried by said clutch member and movable radially into frictional engagement with said drive shaft whereby to impart rotational movement to said clutch member;
3. biasing means carried by said clutch member for normally urging said clutch shoe into frictional engagement with said shaft; and
4. a connecting bracket affixed at one end to said clutch member and at its other end to said projection lens; and

h. a reversing means operatively associated with said motor

means and said film strip for sensing an indicating point on said film and thereupon reversing the direction of rotation of said motor means.

3,937,568

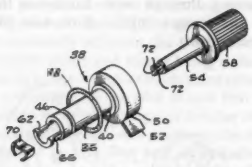
FILM STRIP ADVANCE MECHANISM

Hiroshi Kira, Oxnard, Calif., assignor to Norman Holtzman, Los Angeles, Calif.

Filed Feb. 21, 1974, Ser. No. 444,563

Int. Cl.[2] G03B *23/00*

U.S. Cl. 353—68 **6 Claims**



1. A film strip advance mechanism for a projector having a housing, comprising:

a framing shaft for rotatable positioning in said housing, said framing shaft having a longitudinal axis and being rotatable about said axis with respect to said housing, a resilient spring for interengaging between said framing shaft and said projector housing to provide resilient braking torque between said framing shaft and said projector housing, removable stop means on said framing shaft for interengaging between said framing shaft and the projector housing to stress said resilient braking torque spring to provide braking torque;

an advance shaft coaxially rotatably mounted within and with respect to said framing shaft, detent means interengaging between said advance shaft and said framing shaft to resiliently angularly detent said advance shaft with respect to said framing shaft, said detent means interengaging between said advance shaft and said framing shaft comprising a detent flat on said advance shaft and a detent spring at least partially embracing said framing shaft and said flat on said advance shaft so that rotation of said advance shaft with respect to said framing shaft causes resilient detent spring deflection; and

a sprocket wheel on said advance shaft for advancing a film strip when said framing shaft is rotated.

3,937,569

SLIDE PROJECTOR HAVING A PARTITIONED MAGAZINE

Kurt Henkelmann, Wissmar, Germany, assignor to Ernst Leitz G.m.b.H.

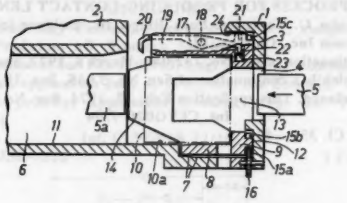
Filed Nov. 23, 1973, Ser. No. 418,257

Claims priority, application Germany, Dec. 13, 1972, 2260887

Int. Cl.[2] G03B *23/04*

U.S. Cl. 353—116 **10 Claims**

1. In combination a slide projector with a film aperture in a side thereof and a partitioned magazine adapted to accept a slide (10) of a given length, said magazine comprising an ejector side positioned at right angles to said film aperture, a top wall (19) with means (17) for retaining a slide in said magazine and a foreshortened bottom wall (8) having a length less than the given length of a slide and defining a foreshortened operative bearing on which a first portion of the length of the slide bears, said projector having a guide track with a bottom face (7) and a face (10a), and said film apesture having a horizontal continuous bearing surface integral with said guide track and configured to said foreshortened bottom wall, said continuous bearing surface and said face (10a) positioned at a higher level than said bottom face for supporting a second portion of the length of the slide in said magazine



and for continuously receiving and transporting the slide through said film aperture.

3,937,570

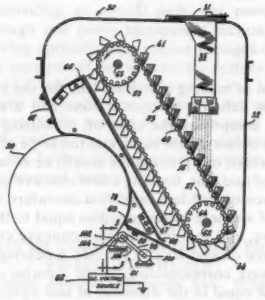
CLOUD SUPPRESSION IN AN ELECTROSTATIC COPYING APPARATUS

Frederick W. Hudson, West Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 149,674, June 3, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 412,925

Int. Cl.[2] G03G *15/08*

U.S. Cl. 355—3 DD **5 Claims**



1. In an electrostatic processor including a movable member having a photosensitive surface for carrying latent electrostatic images and an electrically conductive backing for said surface, and a developer housing having means for delivering a developer containing carrier particles and toner particles to said surface to develop said images; said housing and surface being separated by an air-gap interface permitting free movement of said member but otherwise forming an enclosure for said toner delivery means; the improvement comprising precipitator means for suppressing electrically charged airborne toner particles proximate said interface; said precipitator means including

an electrode mounted adjacent said interface, means for electrically insulating said electrode from ground, means for applying an electrical potential to said electrode having a polarity opposite to the polarity of said image on said surface and for creating an electrostatic field between said electrode and said backing for urging toner particles of one polarity toward said surface and for attracting toner particles of the opposite polarity to said electrode, and means adjacent said electrode for continuously removing toner particles therefrom.

3,937,571

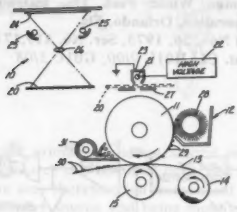
REPRODUCTION SYSTEM UTILIZING ION MODULAR AND DIELECTRIC IMAGING SURFACE

Gerald A. Krulik, Washington, W. Va., and Harvey J. Sable, Cleveland, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Division of Ser. No. 467,391, May 6, 1974. This application Dec. 11, 1974, Ser. No. 531,462

Int. Cl.² G03G 15/00

U.S. Cl. 355—3 R 4 Claims



1. An electrophotographic reproduction apparatus which comprises

a photoconductive ion modulator,

means for imparting a uniform electrostatic charge to said modulator,

means for exposing said modulator to a pattern of light and shadow corresponding to an original image to be reproduced, thereby selectively discharging said modulator and producing a latent electrostatic image thereon,

means for causing an ion stream to impinge upon said modulator carrying said latent electrostatic image,

dielectric means to receive ions passed through said modulator in a pattern corresponding to said latent electrostatic image,

means for developing the resulting latent electrostatic image upon said dielectric means, and

means for simultaneously transferring the resulting developed image from said dielectric means to a receiving material and fixing said image thereon without destroying the latent electrostatic image upon said dielectric means,

said dielectric means comprising a duplex anodized aluminum dielectric surface comprising both barrier type aluminum oxide and porous type aluminum oxide on aluminum.

3,937,572

APPARATUS FOR INDUCTIVE ELECTROPHOTOGRAPHY

Joseph Gaynor, Arcadia; Terry G. Anderson, Pasadena; Walter Hines, Sierra Madre, and Len A. Tyler, Pasadena, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Division of Ser. No. 215,873, Jan. 6, 1972, Pat. No. 3,820,985. This application Feb. 25, 1974, Ser. No. 445,377

Int. Cl.² G03G 15/00

U.S. Cl. 355—16 8 Claims

1. Apparatus for electrostatic reproduction of multiple copies from a single exposure, comprising:

a member having a photoconductive surface adapted for bearing an electrostatic charge and for having an electrostatic image formed thereon as a result of selective radiative discharge by predetermined radiation;

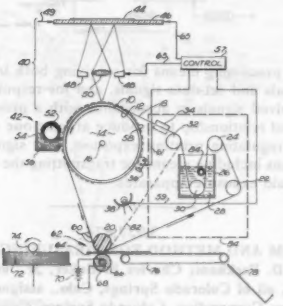
means for applying a substantially uniformly distributed electrostatic charge on said photoconductive surface;

a single thin insulative member having a thickness of from about 0.1 mil to about 3.0 mils, a resistivity of at least 10^{13} ohms/ of surface and sufficient transparency to said radiation for radiative discharge therethrough of said photoconductive surface;

means for applying said insulative member to said charge bearing photoconductive surface following application to said photoconductive surface of said substantially uniformly distributed electrostatic charge, with a first surface of said insulative member in direct contact with said charge bearing photoconductive surface;

means for exposing a predetermined region of said charge bearing photoconductive surface through said insulative member, to a pattern of said radiation to form an electrostatic charge image of said pattern on said photoconductive surface region, said image having a potential sufficient to effect toner-development thereof by induction through said thin insulative member but insufficient to discharge upon removal of said developed image;

means for applying toner to a second surface of said insulative member opposite to said first surface subsequent to formation of said electrostatic image and while said first



surface is in said direct contact with said charge bearing surface at said region thereof to form a toner image of said pattern on said second surface adhered by attraction to the pattern of electrostatic charge on said charge bearing surface;

means for separating said insulative member from said photoconductive surface;

means for transferring said toner image from said thin insulative member to a support member; and

means for reapplying said insulative member in direct contact with said photoconductive surface subsequent to transfer of said toner image for application of further toner thereto while said insulative member is in said reapplied direct contact without further electrostatically charging, and without further exposing, said photoconductive surface region for subsequent toning of and transfer of toner from said reapplied insulative member.

3,937,573

EXPOSURE CONTROL APPARATUS FOR PHOTOGRAPHIC PRINTERS

Bradley D. Rising, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 12, 1974, Ser. No. 496,596

Int. Cl.² G03B 27/78

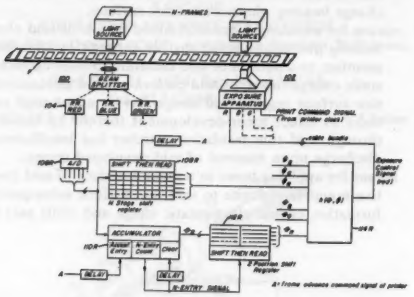
U.S. Cl. 355—83 7 Claims

1. In a photographic printer of the type adapted to receive batches of originals for photographic copying and wherein there is provided an exposure apparatus of a type which regulates printing exposures in response to a control signal, an apparatus for supplying such a control signal comprising:

means for examining originals from such a batch individually to produce individual-data signals representative of an optical density characteristic;

said examining means including means for assigning originals to individual sets;

means for processing individual-data signal information, according to set assignment, to produce at least one set-data signal representative of an overall characteristic of a set of the originals; and



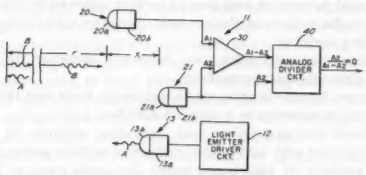
signal processing means for receiving both individual-data signals and set-data signals, and for responding to such received signals in accordance with a preselected functional relationship to produce at least one control signal for regulating printing exposure, said signal processing means including means for transmitting the control signal to said exposure apparatus.

3,937,574

SYSTEM AND METHOD FOR MEASURING DISTANCE

Vernon D. Peckham; Charles E. Baker, Jr., and Donald H. Bryce, all of Colorado Springs, Colo., assignors to Kaman Sciences Corporation, Colorado Springs, Colo.

Filed Oct. 29, 1973, Ser. No. 410,346
Int. Cl.² G01C 3/08
U.S. Cl. 356—4 **25 Claims**



1. A distance measuring system, comprising:

means for generating a beam of electromagnetic energy of selected characteristics and illuminating a target therewith so that at least a fraction of said beam is reflected from said target thereby to form a reflected beam;

first detector means for detecting the intensity of said electromagnetic energy, said first detector means being positioned to receive said reflected beam and being responsive thereto to generate a first signal the magnitude of which is directly proportional to the intensity of said reflected beam at said first detector means;

second detector means for detecting the intensity of said electromagnetic energy, said second detector means being spaced apart in target range from said first detector means, said second detector means being positioned substantially in colinear alignment with the point on said target from which said beam is reflected and said first detector means to also receive said reflected beam, said second detector means being responsive to said reflected beam to generate a second signal the magnitude of which is proportional to the intensity of said reflected beam at said second detector means;

means connected to receive said first and second signals for generating a difference signal the magnitude of which is a function of the difference between the magnitudes of said first and second signals; and

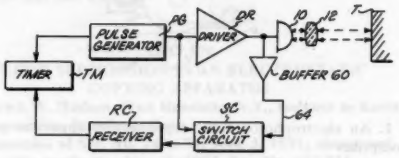
means connected to receive said first signal and said difference signal for generating a quotient signal the magnitude of which is proportional to the magnitude of said first signal divided by the magnitude of said difference signal whereby the magnitude of said quotient signal is a known function and hence a measure of target range.

3,937,575

ELECTRO-OPTICAL RANGING MEANS

George H. Bateman, Winter Park, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Filed Nov. 26, 1973, Ser. No. 419,171
Int. Cl.² H01L 9/00; G01C 3/08
U.S. Cl. 356—5 **11 Claims**



1. An electro-optical distance measuring system comprising:

electro-optical transducer means exhibiting the characteristic of emitting radiant energy within a given infrared wavelength range when driven into a conductive condition, and exhibiting a photo voltaic condition in response to receipt of radiant energy within said given infrared wavelength range,

transducer control means including means for periodically driving said transducer means into conduction so as to emit radiant energy,

optical directing means for directing said emitted energy from said transducer means along a given path toward a target, and for receiving radiant energy traveling in the opposite direction along said given path from said target toward said optical directing means, said directing means directing said received energy to said transducer means so that said transducer means is actuated to the photo voltaic condition upon receipt of radiant energy within said given infrared wavelength range, and

output circuit means for providing a first pulse each time said transducer means is driven into conduction and a second output pulse each time said transducer means is actuated into photo voltaic operation by said received radiant energy whereby the time duration from said first pulse to said second pulse is representative of the distance of said target from said transducer means.

3,937,576

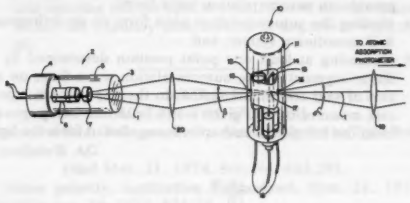
ILLUMINATION SYSTEM FOR AN ATOMIC ABSORPTION SPECTRAL PHOTOMETER

Paul Schmider, Munich-Oberfoehring, Germany, assignor to Beckman Instruments G.m.b.H., Munich, Germany

Filed Apr. 8, 1974, Ser. No. 458,973
Int. Cl.² G01J 3/10
U.S. Cl. 356—74 **7 Claims**

1. An illumination system for an atomic absorption spectrophotometer having an optical input, the system comprising a primary radiation source for producing resonant radiation encompassing the resonant wavelength or wavelengths of the element or elements to be detected, an auxiliary radiation source which produces a continuum of radiation within a wavelength range which includes the resonance wavelength or wavelengths of the primary resonance radiation and is broad

in comparison with the band width of the resonance radiation of the primary source for compensation of a nonspecific absorption in the absorption spectral photometer and means for causing the radiation from the two sources to enter the optical input of the spectral photometer alternately, wherein the improvement comprises:

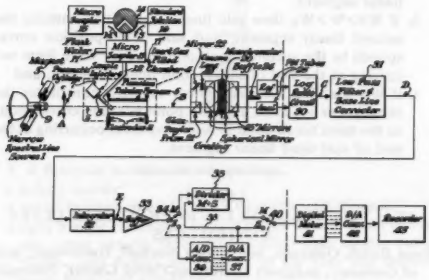


mounting the primary radiation source and the auxiliary radiation source in a common path, said auxiliary source having an area therethrough transparent to the radiation of the primary source and being mounted between said primary source and the optical input of the absorption spectral photometer.

3,937,577
ZEEMAN EFFECT ATOMIC ABSORPTION SPECTROMETER

Robert R. Dorsch, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 15, 1974, Ser. No. 470,189
Int. Cl.² G01J *3/30, 3/42*
U.S. Cl. 356—85 **8 Claims**



1. Apparatus for acyclic spectrochemical trace analysis employing the Zeeman effect comprising, in optical train in the order recited,

a radiation emission source emitting the characteristic spectral line radiation of an element to be analyzed,

magnetic means applying a D-C magnetic field transverse the path of said characteristic radiation in the region of its emission maintaining a substantially steady D-C magnetic flux resolving said characteristic radiation into continuous linear orthogonally polarized radiation components a preselected one of which, the analytical beam, has a specific frequency characteristic of said element to be analyzed and a preselected other of which, the reference beam, has frequencies different from said analytical beam,

furnace means open to the passage of said analytical beam and said reference beam for atomizing a sample of a substance to be analyzed,

optical means segregating said analytical beam and said reference beam along separate courses according to their simultaneous linear orthogonal polarization directions and within preselected wavelength limits, each course being provided with electronic transducing means developing an electrical signal corresponding to the sensed radiation intensity of the respective beam viewed,

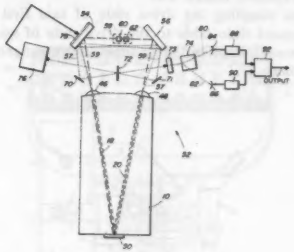
means deriving the logarithmic ratio of said electrical signals one to the other,

and means utilizing said logarithmic ratio in values specific to separate sample and standard analyses to give the concentration of said element to be analyzed in said sample.

3,937,578
LASER GYROSCOPE

Keimpe Andringa, Sherborn, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Feb. 11, 1974, Ser. No. 441,086
Int. Cl. H01s *3/10, 3/22*
U.S. Cl. 356—106 LR **7 Claims**



1. In combination:

a. a laser medium for providing amplification to radiant energy waves passing therethrough, the amplification of such medium being a function of the frequency of such waves and being maximum at a predetermined frequency;

b. means for directing two pairs of radiant energy waves to pass through the laser medium in opposite directions, each one of the waves in the two pairs thereof having a separate frequency, said frequencies being symmetrically disposed about a predetermined frequency;

c. means for combining a portion of each one of the radiant energy waves in at least one of the two pairs of waves passing through the laser medium into a single composite beam having two separate frequencies; and

d. means, responsive to the relative energy level in each one of the waves in such composite beam, for maintaining the separate frequencies of the two pairs of waves passing through the laser medium symmetrically disposed about the predetermined frequency.

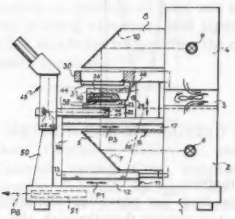
3,937,579
PROCESS FOR THE DOUBLE-SIDED EXPOSURE OF A SEMICONDUCTOR OR SUBSTRATE PLATES, ESPECIALLY WAFERS, AS WELL AS APPARATUS FOR THE PURPOSE OF PARALLEL AND ROTATIONAL ALIGNMENT OF SUCH A PLATE

Jean Schmidt, Cluses, France, assignor to Karl Suss KG, Munich, Germany

Filed Nov. 15, 1973, Ser. No. 416,227
Claims priority, application Germany, Nov. 20, 1972, 2256759
Int. Cl.² B41M *3/08;* **G03B** *27/36, 27/60*
U.S. Cl. 356—144 **10 Claims**

2. Apparatus for parallel and rotational alignment of a substrate plate such as a semiconductor wafer, or the like, relative to first and second exposure masks adapted to be effective to one to either of the two opposed major surfaces of the wafer, for the purpose of double-sided exposure thereof, and comprising:

a. means for establishing an exposure beam path for said opposed surfaces of a wafer held by said apparatus;
b. an adjustable wedge-error correction head for supporting the wafer for plane parallel adjustment of one major surface of the wafer relative to the first of said exposure masks;
c. apparatus for moving the opposed surface of said wafer into contact with said second exposure mask;
d. first support means for arranging and supporting said first exposure mask and including a rotational compound slide table, and having means for the plane parallel position calibration of said first exposure mask relative to one major surface of said wafer relative to a microscopic viewing device;
e. a microscopic viewing device in viewing relationship with an exposure mask supported in said first support means;
f. an auxiliary rotational compound slide table having a second mask support means for receiving the second of said exposure masks; and
g. means coupling the drive slide of said first rotational compound slide table to the drive slide of said auxiliary rotational compound slide table, the arrangement being such that:



1. the first mask support means is connected to its associated rotational compound slide table through a support approachment guide means extending normal to the plane of travel of the first and second compound slide tables;
2. one of said mask supports being constructed as an adjustable wedge-error calibration frame in one of said compound slide tables; said wedge-error correction head being arranged to receive said wafer and being bearingly mounted to a swivel arm, with said swivel arm being pivotable in a rotational plane lying generally parallel to and intermediate the planes of displacement of said two rotational compound slide tables, said swivel arm being pivotally movable along an axis perpendicular to the planes of displacement of said first and second mask support means;
3. means on said swivel arm for moving said swivel arm together with a wafer disposed thereon toward the surface of a selected one of said exposure masks until contact is achieved between the surface of said wafer and the surface of said selected exposure mask; and
4. means on said swivel arm for releasably retaining said wafer for carrying said wafer to and from contact with said selected exposure mask.

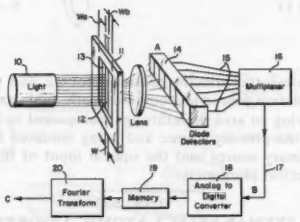
3,937,580

ELECTRO-OPTICAL METHOD FOR MEASURING GAPS AND LINES

Harvey Lee Kasdan, Van Nuys, Calif., assignor to Recognition Systems, Inc., Van Nuys, Calif.

Filed July 11, 1974, Ser. No. 487,588
Int. Cl.² G01B *11/02*
U.S. Cl. 356—156 **1 Claim**

1. A method of measuring a given width, W of a line in an aperture comprising the steps of:
a. radiating the aperture with coherent light to cause generation of a diffraction pattern by said given width;
b. detecting said diffraction pattern to provide an analog electrical function;
c. converting said function to a digital form;
d. computing the Fourier transform of said digital form to provide an autocorrelation wave form;
e. plotting the autocorrelation wave form on an orthagonal X-Y coordinate system; and
f. measuring at least one point position determined by a linear segment in the autocorrelation wave form on an axis of said coordinate system to thereby provide a precise measure of said given width, said line being spaced from the left side of said aperture as viewed from the light



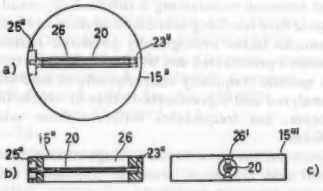
source by a distance W*a* and from the right side of the aperture by a distance W*b*, and wherein:
g. if W*a*>W*b*>W then said linear segment constitutes the initial linear segment of said autocorrelation wave form and said point position corresponds to the first break point in said wave form occurring at the end of said initial linear segment;
h. if W*b*>W>W*a* then said linear segment constitutes the second linear segment, and said point position corresponds to the second break point in said wave form occurring at the end of said second linear segment; and
i. if W>W*a*>W*b* then said linear segment constitutes the third linear segment, and said point position corresponds to the third break point in said wave form occurring at the end of said third linear segment.

3,937,581

ANALYTIC CELL FOR USE IN HIGH-SPEED ULTRA CENTRIFUGES

Egon Rodel, Osterode, and Volker Neuhoff, Goettingen, both of Germany, assignors to Heraeus-Christ GmbH, Osterode, Harz and Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Goettingen, both of, Germany

Filed May 13, 1974, Ser. No. 469,539
Claims priority, application Germany, May 17, 1973, 2324879
Int. Cl.² G01N *1/10*
U.S. Cl. 356—246 **19 Claims**



1. Analytic cell for use in a centrifuge, particularly an ultra high-speed centrifuge comprising
a housing (10);
a disk-shaped central part (15, 30) located in the housing and formed with a radially extending light-transmissive

slit across the part (24, 24', 26, 26', 29), the central part being further formed with a radially extending opening extending in alignment with the light-transmissive slit and of sufficient size to permit introduction of a capillary tube therein;

and a capillary tube of light-transmissive material located in said opening and for optical evaluation of test substances within the capillary tube located in alignment with said slit.

3,937,582

FOUNTAIN TOOTHBRUSH

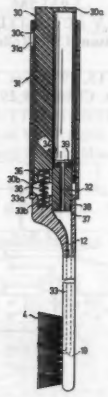
Franco Del Bon, Zofingen, Switzerland, assignor to Trisa Burstenfabrik AG

Filed Mar. 21, 1974, Ser. No. 453,391

Claims priority, application Switzerland, Mar. 21, 1973, 4004/73; Jan. 19, 1974, 875/74

Int. Cl. A46b *11/00*

U.S. Cl. 401—134 **9 Claims**



1. A fountain toothbrush compsiring:

a bristle carrier;

a set of bristles on said carrier near one end thereof;

a rigid handle connected to said bristle carrier at an end of the latter remote from said bristles, said handle being hollow and having an opening at the rear end thereof away from said bristle carrier;

a rigid-walled reservoir for liquid or pasty dentifrice and being connected to said handle axially displaceable relative thereto, and protruding with its closed rigid rear end from said rear end opening when in rest position, said bristle carrier having a duct therethrough leading from the end of said bristle carrier joined to said handle to an outlet near or between said bristles;

piston means rigidly mounted on said bristle carrier at the end thereof joined to said handle and having an axial bore therein being in free communication with said duct in said bristle carrier and opening out of the rear end of said piston means facing toward said reservoir; and

said reservoir having a hollow interior and an outlet passage from said interior at the end thereof toward said bristle carrier, said piston means being sealingly inserted at rest and in actuated position in said outlet passage and adapted for a short displacement in said outlet toward and away from said reservoir, said outlet passage being in free communication with said duct at all times, whereby by a short displacement of said piston in said outlet passage toward said reservoir, dentifrice is caused to flow freely from said reservoir through said duct towards said bristles, said duct having in said bristle carrier, over at least a short length thereof, a diameter small enough to exert a capillary action on the dentifrice in said reservoir, thereby preventing dentifrice from leaking through said outlet passage into said duct, when said piston means are not displaced towards said reservoir; and

spring means for returning said reservoir to its rest position relative to said piston after each short displacement of the former toward said bristle carrier.

3,937,583

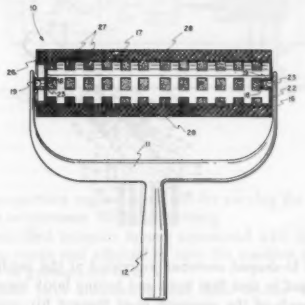
PAINT ROLLER

James D. Tyson, Carthage, and R. G. Harris, Lexington, both of N.C., assignors to Tyson Paint Roller Company, Inc., Carthage, N.C.

Continuation-in-part of Ser. No. 310,324, Nov. 29, 1972, abandoned. This application July 22, 1974, Ser. No. 490,579

Int. Cl. B44d *3/28*

U.S. Cl. 401—197 **3 Claims**



1. An improved painting device comprising: a generally Y-shaped bail and handle unit integrally formed from a molded plastic type material and wherein the bail portion of the bail and handle unit is generally U-shaped in cross section and contains a plurality of integral partitions extending across said U-shaped cross section whereby a strong lightweight unit is produced and wherein the outer ends of the bail portion of the bail and handle unit are toed inwardly toward each other in normal rest position whereby when moved outwardly apart, an inwardly biasing effect is obtained; an axial opening provided in the end of the handle opposite the bail whereby a handle extension can be retainingly inserted thereinto; inwardly projecting nipples fixedly secured one on each end of the bail portion of said unit; a perforate, generally cylindrical shaped reservoir-roller closed at one end and formed from a moldable, plastic type material; and end cap removably insertable in the open end of said cylinder; a dimple-like depression centrally formed in the exterior of the closed end of said reservoir-roller; a dimple-like depression centrally formed in the exterior of said end cap whereby each of said dimple-like depressions rotatably engage one of said dimples thereby rotatably supporting said reservoir-roller on said bail and handle unit; and an absorbent covering disposed around said cylindrical shaped reservoir-roller whereby paint contained therein can be applied to a surface to be painted.

3,937,584

APPARATUS FOR SECURING AN ELONGATED HANDLE TO THE BACK OF A BRUSH OR THE LIKE

Elven O. Freeman, 5824 N. Harvard Drive, Oklahoma City, Okla. 73122

Filed Mar. 7, 1975, Ser. No. 556,559

Int. Cl.[2] B25G *3/24*

U.S. Cl. 403—256 **7 Claims**

4. A handle assembly alternately securable to and releasable from a brush or the like of the type having a back with a top,

bottom and opposite sides, with bristles or the like extending from the bottom thereof, comprising:

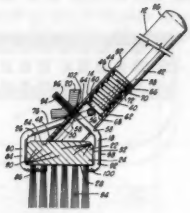
an elongated handle having first and second ends;

an elongated member having first and second ends with a first end face formed on the first end and a second end face formed on the second end with the second end face lying in a plane oblique to the longitudinal axis of said elongated member;

means for securing the second end of said elongated handle to the first end of said elongated member;

a first bore formed in said elongated member aligned along a line normal to the longitudinal axis of said elongated member and lying in a plane parallel to the plane of the second end face of said elongated member;

a second bore formed in said elongated member intermediate said first bore and the second end face thereof, said second bore being aligned along a line normal to the longitudinal axis of said elongated member;



a rigid U-shaped member journaled at the medial portion thereof in siad first bore and having hook means formed on each of the opposite ends thereof for engaging one side and the bottom of the back of the brush;

a rigid hook member having a first end and a second end with hook means formed on the first end thereof for engaging the opposite side and the bottom of the back of the brush and with external threads formed on the second end thereof extending through said second bore;

internally threaded nut means for engaging the external threads of the second end of said rigid hook member for drawing the hook means thereof and the two hook means of said U-shaped member into secure engagement with the opposite sides and bottom of the back of the brush and mutually engaging the second end face of said elongated handle with the top of the back of the brush.

3,937,585

PARTIALLY ROTATED FASTENER

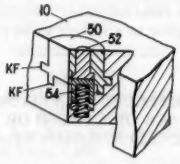
David Christopher Cattermole, Enfield, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

Filed Sept. 29, 1972, Ser. No. 293,342

Claims priority, application United Kingdom, Nov. 30, 1971, 55510/71

Int. Cl. F16b *5/00, 21/02*

U.S. Cl. 403—300 **5 Claims**



1. A fastening system comprising a pair of semi-cylindrical body parts which may be brought together in face to face relationship to form a cylindrical fastener which is symmetrical about a center axis of rotation, said cylinder having a predetermined height measured along said axis, first and second mutually perpendicular annular key flanges integrally formed on each body part adjacent one end thereof, each of said flanges having a thickness which is much less than said height, said first annular key flange extending away from said body perpendicularly with respect to said axis, said second annular key flange extending parallel to said axis, a plurality of object parts to be fastened together along predetermined surfaces thereof, each object part having an arcuate semi-cylindrical raceway formed therein with internal raceway contours which are exactly complementary to the external contours on said fastener body parts, and the raceways in said object parts fitting together to form a single composite cylindrical raceway when said object parts are brought together in a mating face to face relationship, whereby said two body parts of said fastener span and join said semi-circular raceways to securely interconnect said two object parts when said fastener is partially rotated.

3,937,586

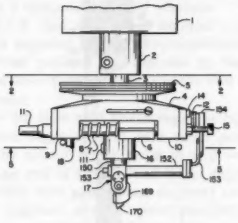
HYDRAULICALLY ACTUATED MACHINE TOOL

Sanders Chapman Watson, 1358 Roller Coaster Road, Tucson, Ariz. 85704

Filed Dec. 13, 1973, Ser. No. 424,328

Int. Cl.² **B23B** *29/034*

U.S. Cl. 408—147 **11 Claims**



1. A hydraulically operated machine tool attachable to and supported solely by a rigid spindle machine for laterally displacing a cutting element at a predetermined rate commensurate with the rate of rotation of the rigid spindle machine; said machine tool comprising in combination:

a. a main body, said main body including an arbor extending therefrom for engagement with the collet of the rigid spindle machine to support said main body in relationship to a work piece;

b. A reservoir of hydraulic fluid disposed within said main body;

c. reciprocating means responsive to rotation of said main body and disposed within said main body for pumping the hydraulic fluid from said reservoir, said reciprocating means including:

i. a plunger and a further plunger disposed within a cylindrical cavity and a further cylindrical cavity, respectively, in said main body;

ii. a first passageway and a third passageway extending from said reservoir to said cylindrical cavity and to said further cylindrical cavity, respectively;

iii. a second passageway and a fourth passageway extending from said reservoir to said pressure chamber; and

iv. a check valve disposed within said first passageway to limit the flow of hydraulic fluid therethrough in one direction and a further check valve disposed within said third passageway to limit the flow of hydraulic fluid therethrough in one direction;

d. selectively actuatable means disposed within said main body for controlling the length of the stroke of said reciprocating means to selectively vary the volume of hydrau-

lic fluid pumped per revolution of said main body, said controlling means including:

i. a swash plate for axially displacing said plunger;

ii. means for restraining the rotational movement of said swash plate induced by said main body; and

iii. said swash plate being of a non-uniform thickness; whereby, said swash plate induces reciprocating axial movement of said plunger in response to relative movement of said swash plate and said plunger;

e. a pressure chamber disposed within said main body for receiving the hydraulic fluid pumped by said reciprocating means, including a pressure relief conduit for venting the hydraulic fluid back to said reservoir;

f. a movable carriage slidably attached to said main body, said carriage being positionable lateral to the axis of said arbor in response to the volume of hydraulic fluid received by said pressure chamber; and

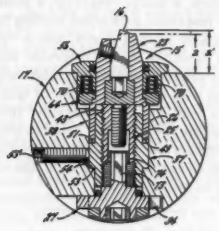
g. means for attaching the cutting element to said carriage; whereby, said machine tool is self contained by including all operative elements necessary to rotate the cutting element at the rate of rotation of the rigid spindle machine while simultaneously selectively displacing the cutting element laterally at a rate determined by said controlling means.

3,937,587

ADJUSTABLE CUTTER TOOTH MOUNTING

Thomas J. Lindem, and Jan Van Roojen, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed July 5, 1974, Ser. No. 485,802
Int. Cl.² B23B *51/00, 39/14*
U.S. Cl. 408—181 **12 Claims**



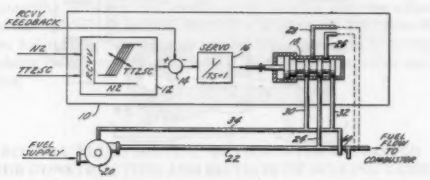
12. A mounting for supporting a cutter tooth for adjustment in fine increments having, in combination, a rotatable body with a hole extending therethrough, a cartridge telescoped into said hole from one end thereof and adapted for coarse adjustment of the cutter tooth prior to being inserted into the hole, said cartridge including a holder disposed within and slidably guided along said one end portion of said hole, said tooth being secured to the outer end of said holder and providing a tip for cutting engagement with a workpiece during rotation of said body, means securing said holder within said hole against rotation while permitting the holder to be slid axially in fine increments to adjust the position of said tooth, a nut mounted within said hole and being secured against movement within said hole and a differential screw including a first thread of predetermined pitch mated with said nut initially in a predetermined position within said nut during assembly of said cartridge and a second thread whose pitch is less than said predetermined pitch, said holder having an internally threaded recess formed in the inner end portion thereof and mating with said second thread, a driver recess formed in the inner end portion of said screw to receive a driver for turning said screw to adjust the holder in fine increments in an axial direction with respect to said hole, and abutting means on said nut and within said hole for locating said nut in a predetermined axial position within said hole, said cartridge being insertable into said hole only from the end of the hole from which the cutter projects.

3,937,588

EMERGENCY CONTROL SYSTEM FOR GAS TURBINE ENGINE VARIABLE COMPRESSOR VANES

John H. Kisslan, Jupiter, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed July 24, 1974, Ser. No. 491,421
Int. Cl.² F01B *25/00*
U.S. Cl. 415—17 **6 Claims**



1. In a gas turbine engine, a control for varying the position of the rear compressor vanes comprising

fluid controlled actuator means connected with said compressor vanes and adapted to vary the position thereof,

a source of pressurized fluid,

a first fluid path connecting said fluid source with said actuator means,

a second fluid path connecting said fluid source with said actuator means,

a first slide valve connected in both said first and second fluid paths, said first slide valve having a first position which permits passage therethrough of the fluid in said first fluid path only, and having a second position which permits passage therethrough of the fluid in said second fluid path only, said first slide valve normally being in said first position,

means responsive to selected engine operating conditions for generating a first control signal indicative of desired compressor vane position,

servo valve means connected in said first fluid path and responsive to said first control signal for regulating the flow of fluid in said first fluid path to thereby vary the position of said compressor vanes when said first slide valve is in said first position,

means for generating a second control signal indicative of desired compressor vane position,

and means for connecting said second control signal to said actuator means, said second control signal being adapted to actuate said actuator means and regulate the position of said compressor vanes and regulate the position of said compressor vanes when said first slide valve is moved to said second position.

3,937,589

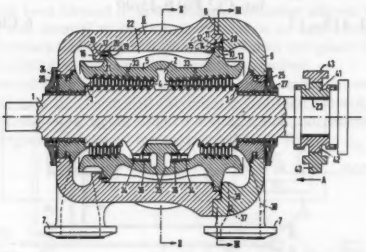
HIGH PRESSURE DOUBLE FLOW TURBINE CONSTRUCTION

Axel Remberg, Mulheim, Germany, assignor to Kraftwerkunion AG, Mulheim (Ruhr), Germany

Continuation of Ser. No. 363,124, May 23, 1973, abandoned. This application Nov. 4, 1974, Ser. No. 520,866
Int. Cl.² F01D *3/02, 25/24*
U.S. Cl. 415—101 **2 Claims**

2. Multi-shell turbine with double-flow construction, designed for high steam pressure and high steam temperatures, having an outer housing and an inner shell which is split only

in one axial plane, said inner shell carrying the vane rings of both flows and comprising the inlet channels for the fresh steam, wherein the outer housing is of generally cylindrical shape and has an open end, a closed end, and a cover segment with exhaust member, said cover segment closing said open end and defining therewith a normal-to-axis joint, the outer diameter of said outer housing being proportionally greater in the vicinity of said open end and cover segment than in the



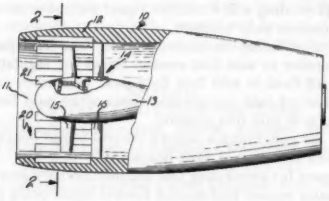
vicinity of said closed end, the inner shell in the vicinity of the normal-to-axis joint having radially outwardly extending extension studs projecting radially at the outer periphery of said extension, said studs fitting in axial grooves on a shoulder of said outer housing to engage the partitions which define the front surface of the outer housing, whereby the inner shell is radially held and axially mounted and fixed solely through the studs, after the housing segment has been mounted and bolted.

3,937,590

ACOUSTIC DUCT WITH PERIPHERALLY SEGMENTED ACOUSTIC TREATMENT

Ramani Mani, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sept. 3, 1974, Ser. No. 503,031
Int. Cl.[2] F04D 29/66
U.S. Cl. 415—119 **9 Claims**



1. In a noise-suppressing duct having mounted therein rotating mechanical equipment with first stage rotor and stator blades which interact to generate spinning mode acoustic pressure fields with propagating and attenuating type modes, said duct being a rigid longitudinally extending duct with an acoustic lining attached to the inner surface thereof, the improvement in which said acoustic lining comprises

a first set of peripherally spaced, longitudinally extending strips of sound-absorbing material, said first set of strips being relatively narrow in the peripheral direction and in total number at least exceeding the number of first stage rotor blades,

a second set of peripherally spaced, longitudinally extending strips of sound-absorbing material mounted flush with said first set of strips and located between and alternating with said first set of strips,

said first and second set of strips being made of sound-absorbing materials having different acoustical impedances and in combination forming a continuous acoustic lining,

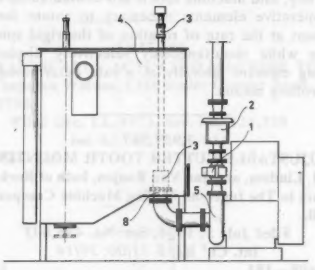
said first and second set of strips being effective to achieve scattering of said spinning mode acoustic pressure fields to increase the attenuating mode type content for improved noise suppression.

3,937,591

CONTROLLING A SLUDGE FLOW

Vilho Viljo Jantunen, Pyhakumpu, Finland, assignor to Outokumpu Oy, Outokumpu, Finland

Filed Nov. 2, 1973, Ser. No. 412,166
Claims priority, application Finland, Nov. 6, 1972, 3089/72
Int. Cl.[2] F04D 15/00
U.S. Cl. 415—157 **4 Claims**



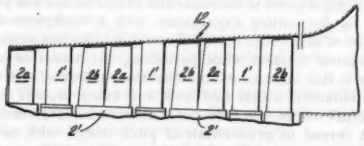
1. In combination, a sludge reservoir, a pump for pumping sludge from said reservoir, a channel leading from said reservoir to a suction side of said pump, and a valve submerged during operation in sludge in said reservoir, said valve having a pair of coaxially related members in relatively slidable interfitted relationship with each other, one of said members having an apertured wall for sliding against the other of said members, and means for effecting relative sliding movement between said members for controlling sludge flow through one or more apertures of said apertured wall, one of said members being connected to said channel.

3,937,592

MULTI-STAGE AXIAL FLOW COMPRESSOR

Karl Bammert, Hannover, Germany, assignor to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 365,583, May 30, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,219
Int. Cl.[2] F04D 19/00, 19/02
U.S. Cl. 415—194 **4 Claims**



1. A multistage axial compressor comprising a rotatable shaft having a plurality of rings with blades defining moving blade rows interspersed with a plurality of guide blade rows, said rows being arranged in an initial and a final stage with a plurality of intermediate stages between said initial and said final stage, each intermediate stage including a moving ring with two rows of moving blades and a single guide blade row, said initial and final stages comprising an initial stage with a single guide blade row and a moving ring with two rows of

blades and a final stage comprising a single guide blade row, said shaft being foreshortened by providing one row of said guide blades to take up the pressure of two rows of said moving blades at 100% reaction between said initial stage and said final stage.

3,937,593

ROTOR ASSEMBLIES

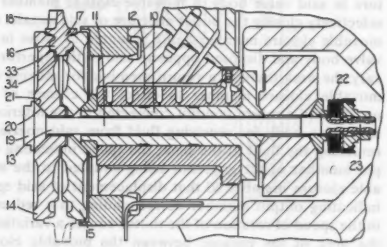
John Anthony Jeyes, and Ronald Edward Blakeley, both of Solihull, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Mar. 18, 1974, Ser. No. 452,463

Claims priority, application United Kingdom, Apr. 17, 1973, 18408/73

Int. Cl.² F01D 5/30

U.S. Cl. 416—214 A 8 Claims



1. A rotor assembly comprising a rotatable shaft, first and second annular discs axially spaced on the shaft and rotatable with the shaft, a plurality of rotor blades located between the discs and angularly spaced around the axis of the shaft, and means urging the discs against the blades so that a root portion of each blade is trapped between the discs with the remainder of the blade projecting from the discs, each root portion being shaped so as to be non-complementary with the portions of the disc between which it is trapped, and each disc being shaped so as to present to each root portion first and second surfaces which, when the shaft is rotated in use, engage first and second spaced regions respectively of the root portion so that the root portion is held respectively against movement radially outwardly relative to the axis of the shaft and against axial movement relative to the shaft, said first surface of each disc presented to a respective root portion being curved about the axis of the shaft and the associated first region of said respective root portion being defined by a further surface which is similarly curved about the axis of the shaft, but which has a radius less than the radius of the curve defined by said first surface so that there is point contact between the surfaces.

3,937,594

OBJECT DISPOSED IN A FLUID FLOW AND HAVING A SELECTED CONFIGURATION TO MINIMIZE GENERATION OF KARMAN'S VORTEX STREET

Hideo Ito; Mizuho Tanaka, and Harumasa Sato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 23, 1974, Ser. No. 463,430

Claims priority, application Japan, Apr. 27, 1973, 48-47258

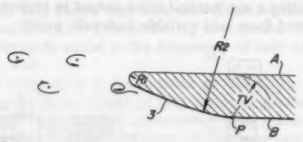
Int. Cl.² B64C 3/14; F01D 5/14

U.S. Cl. 416—223 A 5 Claims

1. A fluid foil section having a selected configuration to minimize the generation of Karman's vortex street when disposed in a moving fluid and is defined by two surfaces, each extending along a stream line and one of said two surfaces forming a reference surface, said foil section being characterized by a selected configuration satisfying the following relations:

$$R1/TV \leq 0.2 \text{ and } R2/TV \text{ is in the range of } 6\text{–}10$$

where, R1 is a radius of curvature of a trailing edge portion of the foil section's downstream end portion which is continuous with said reference surface, R2 is a radius of curvature of a second portion of the foil section's downstream end portion



extending between said trailing edge portion and the other surface of the foil section, and TV is a minimum thickness of the foil section between said two surfaces measured from the joining point between said second portion and the other surface.

3,937,595

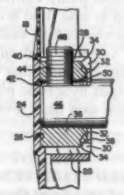
ROTARY FLUID MOVING DEVICE WITH IMPROVED HUB CONSTRUCTION AND METHOD OF MAKING SAME

George A. English, and Charles R. Marracino, both of Torrington, Conn., assignors to Torin Corporation, Torrington, Conn.

Filed July 5, 1974, Ser. No. 486,110

Int. Cl.² F04D 29/32

U.S. Cl. 416—244 R 10 Claims



1. A rotary fluid moving device of molded plastic construction and comprising a plurality of similar circumaxially arranged fluid moving blades and an associated central hub section, said hub section comprising a plurality of similar axially projecting flexible fingers formed integrally and arranged in a circumaxially spaced series to form a collet defining a cylindrical hub cavity, a cylindrical centrally apertured hub of metallic construction disposed in said cavity and adapted for positive connection with a drive shaft entered in its said central aperture, and an arcuate clamping member disposed about said fingers and extending at least through an angle of 180°, said clamping member engaging said fingers and exerting generally radial inward pressure thereon and indirectly on said hub for retention of the latter in said cavity.

3,937,596

FLUID PUMP DRIVING CONTROL

Robert O. Braidwood, Fort Lauderdale, Fla.

Continuation of Ser. No. 355,902, April 30, 1973, abandoned. This application Jan. 24, 1975, Ser. No. 544,019

Int. Cl.² F04B 49/00

U.S. Cl. 417—36 4 Claims

1. A system for maintaining a predetermined fluid level in a fluid storage wet well to compensate for variable quantities of fluid received in said wet well comprising:

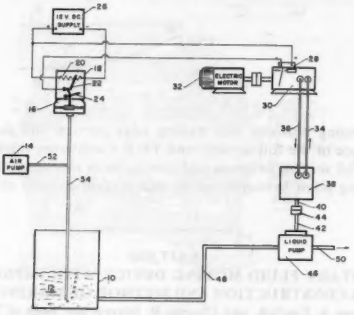
fluid storage wet well,

a fluid level sensing means connected within said storage wet well providing a variable output signal proportional to the level of the fluid contained therein;

a variable output hydraulic pump, said pump including a means for varying the hydraulic output of said pump;

a constant speed electrical drive means connected to said variable hydraulic pump for driving said hydraulic pump;

a hydraulic motor in fluid communication with the output of said variable hydraulic pump, the hydraulic motor providing a mechanical drive output in response to fluid received from said variable hydraulic pump;



a variable volume fluid pump connected to the mechanical drive output of said hydraulic motor, said fluid pump having a fluid input connected into said storage wet well and a fluid output;

a variable volume fluid pump control means having an input circuit connected to said fluid level sensing means and an output circuit connected to said means for varying the output of said variable hydraulic pump, said control means output signal controlling the hydraulic output of said variable output hydraulic pump as a function of the output signal from said fluid level sensing means.

3,937,597

PRESSURIZED FLUID FEED APPARATUS

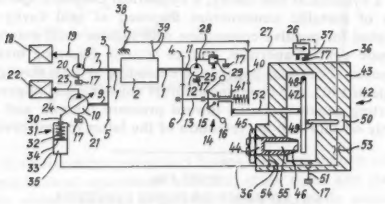
Sergè B. Bacquie, La Croix Saint Ouen, and Jean-Francois M. Cheylus, Compiegne, both of France, assignors to Poclain, Le Plessis Belleville, France

Filed Oct. 3, 1974, Ser. No. 511,822

Claims priority, application France, Oct. 3, 1973, 73.35395

Int. Cl.² F04B *49/00, 1/26*

U.S. Cl. 417—216 **14 Claims**



1. An apparatus for feeding pressurized fluid constituted by:

a fluid tank,

at least one variable c.c. pump having a pump output control member for varying its output,

at least one receiver member of which the power necessary for said receiver member to be driven is substantially constant,

a motor having an output shaft for driving the variable c.c. pump and the receiver member, the maximum power of said motor being less than the sum of the maximum drive powers of said pump and said receiver members,

and a regulation device for regulating the total drive of the pump and the receiver members to a value at the most equal sum to the maximum power of the motor, said regulation device itself being constituted by:

a governor having an input coupled to the output shaft of the motor and having a speed indicating output member positioned as a function of the speed of rotation of the motor,

a source of piloting fluid at constant pressure,

a piloting conduit connected to said source of piloting fluid,

a control motor having a motor output member coupled to the pump output control member for controlling the cubic capacity of said pump and which includes a drive chamber connected to the source of piloting fluid by said piloting conduit:

and a closure valve comprising a valve body, wherein said valve comprises in addition a nozzle having an inlet connected to said source of piloting fluid and an outlet aperture in said valve body, a movable closure member for selectively closing the outlet aperture of said nozzle, said movable closure member being mounted to move in the valve body and disposed opposite said outlet aperture to vary the area thereof, a return member for moving said movable closure member to effect the closure of the nozzle, and a return conduit connected to the interior of said valve body for receiving fluid from said nozzle for returning the fluid to the tank, the speed indicating output member of the governor being coupled to the movable closure member so that displacement of said speed indicating output member corresponding to a reduction in the speed of rotation of the motor causes a variation in the area of the passage between the movable closure member and the nozzle which brings about a variation in the pressure of the fluid feeding said control motor and a consequent displacement of the motor output member and the oump output control member which is connected thereto to effect a reduction in the corresponding cubic capacity of said variable c.c. pump.

3,937,598

ENCASED REFRIGERATING MACHINE

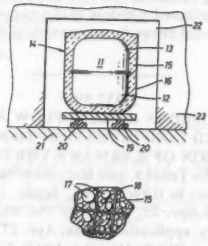
Jorgen Stannow, Sonderborg; Kjeld Kjeldsen, Nordborg; Bent Karli, and Ole Joker Nissen, both of Augustenborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 30, 1974, Ser. No. 519,353

Claims priority, application Germany, Nov. 2, 1973, 2354897

Int. Cl.² F16F *15/00*

U.S. Cl. 417—363 **15 Claims**



1. A refrigerating machine of the type having a casing for containing an electric motor and reciprocating compressor means, comprising a completely closed sheet metal casing, mass means in the form of a layer bonded to and substantially surrounding the exterior of said casing, said mass means being at least one-half as heavy as said casing.

3,937,599
PUMPING SYSTEM USING SOLAR ENERGY

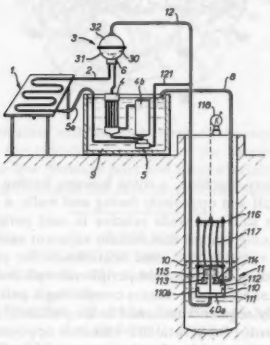
Pierre Thureau, Cachan, and Michel Bremont, L'Hay-les-Roses, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Oct. 11, 1974, Ser. No. 514,175

Claims priority, application France, Oct. 19, 1973, 73.37374; July 5, 1974, 74.23399; July 12, 1974, 74.24278

Int. Cl.² F04B *17/00, 9/08;* **F03G** *7/02;* **F03C** *5/00*

U.S. Cl. 417—389 **25 Claims**



1. A pumping system comprising a pumping unit formed by a motor and a pump and adapted to raise a liquid from an underground level to a utilization level, a vaporizable fluid flowing in a closed circuit between a solar evaporator and a condenser, the said motor being disposed in the outgoing branch between the evaporator and the condenser and a circulator being disposed in the return branch to the said evaporator, and in which system the motor comprises a motor chamber which is connected by a bistable distributor either to the evaporator when said distributor is in an intake state, or to the condenser when said distributor is in an exhaust state, said motor chamber being partly defined by a flexible wall free to move between an intake stroke end position and an exhaust stroke end position, the flexible wall triggering the changes of state of the distributor by reaching its two end positions, the said pumping system being characterized in that the distributor is biased by a resilient means into one of its two stable states on either side of an unstable equilibrium state, and is urged into its stable exhaust state by a flexible band tensioned by said flexible wall in the intake stroke end position, and is pushed into its stable intake state by said flexible wall in its exhaust stroke end position, a transmission chamber separated from said motor chamber by the said flexible wall, and a pump unit having, on either side of a deformable diaphragm, a pump chamber provided with an intake valve drawing from the said underground water level, and a delivery valve for delivery to the said utilization level and a reception chamber communicating with the said transmission chamber via a two-way pipeline, an incompressible transmission liquid complementally filling the said transmission and reception chambers as it flows in the said two-way position.

3,937,600
CONTROLLED STROKE ELECTRODYNAMIC LINEAR COMPRESSOR

Harlan V. White, Scotia, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed May 8, 1974, Ser. No. 467,848

Int. Cl.² F04B *35/04*

U.S. Cl. 417—416 **5 Claims**

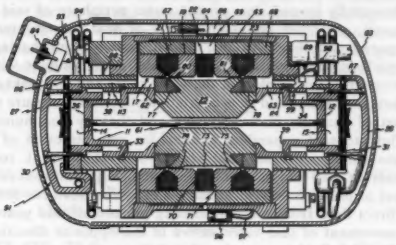
1. A compressor comprising:

a. an electrodynamic motor adapted to be driven cyclically by an AC power source;

b. a piston coupled to and adapted to be driven within a selectiively valved working cylinder by said motor substantially in synchronism with said power source;

c. enclosed volumes of gas acting as resilient means coacting with said piston and with said motor to form a mechanical resonant system having a resonant frequency approximately equal to the frequency of said AC power source; and

d. means responsive to the position of said piston for controlling the force output of said motor to provide stable operation over varying compressor load conditions by varying the resonant frequency of said resonant system, increasing said resonant frequency in response to increasing piston stroke, and decreasing said resonant frequency in response to decreasing piston stroke, said means including first means communicating said enclosed volumes of gas with each other at an intermediate stroke position of said piston through a volume whose pressure is determined by the pressure of said enclosed volumes of gas to equalize the gas pressures in said enclosed volumes during operation and second means communicating one of said enclosed volumes of gas with a reservoir of gas at higher pressure whenever said piston exceeds a prdetermined stroke position so that gas flows from said reservoir into said enclosed volume increasing the gas pressure therein and effecting an increase in the stiffness of the resilient means and thereby increasing the resonant frequency of said mechanical resonant system.



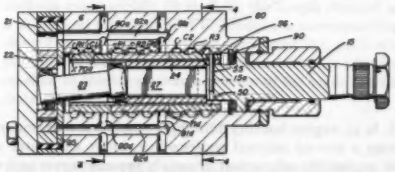
3,937,601
HYDROSTATIC CONTROLLER WHEREIN THE CONTROL VALVE SPOOL INCLUDES THE COMMUTATOR VALVE

Laurence Lockhart Miller, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 22, 1974, Ser. No. 453,713

Int. Cl.² F01C *1/02;* **F04C** *1/02*

U.S. Cl. 418—61 B **8 Claims**



1. A hydrostatic controller for controlling fluid flow to a device, said controller comprising a housing, a gearset in said housing, said gearset having relatively rotatable and orbital internal and external meshing gears, the teeth of which define chambers which expand and contract upon relative orbital and rotational movement therebetween, said housing having

an inlet port and a pair of outlet ports for communication with said device, a valve spool located in said housing, said valve spool and said housing having fluid conducting passages comprising both a commutator valve means for directing fluid to said expanding pockets and for receiving fluid from said contracting pockets and a directional control valve means for directing fluid from said contracting pockets to a selected one of said outlets, said valve spool being mounted in said housing for axial and rotational movement relative thereto, an input means connected with said valve spool for effecting axial movement of said valve spool in opposite directions from a neutral position in response to rotational movement of said input means in a given direction and for thereafter effecting rotational movement of said valve spool with said input means, said commutator valve means and said directional control valve means including first and second sets of circumferentially spaced slots on the outer periphery of said valve spool, said first and second sets of said circumferentially spaced slots being axially spaced, said housing having two axially spaced sets of passages which communicate with the respective sets of slots in the valve spool and with said chambers, one set of said slots communicating fluid pressure to one set of passages in the housing and thereby communicating fluid to said expanding pockets on one direction of axial movement of said valve spool and subsequent rotation thereof, and said one set of slots receiving fluid from said one set of passages in said housing and having surfaces acting to direct fluid from said contracting pockets of said gearset on movement of said valve sleeve in the opposite direction for directing fluid to one of said outlets.

3,937,602

ENGINE HOUSINGS

John Sharples, Sandbach, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed Sept. 4, 1974, Ser. No. 503,083

Claims priority, application United Kingdom, Sept. 15, 1973, 43413/73

Int. Cl.[2] F01C *21/06*

U.S. Cl. 418—83 6 Claims

2. In an engine housing defining a combustion chamber and having a curved internal wall surface, inner and outer walls with a plurality of coolant channels therebetween and webs separating adjacent channels, at least some of said webs extending in a non-radial direction relative to the local curved internal wall surface such that the coolant channels bounded by those webs are of a triangular section and transverse forces on the said some of said webs extending in a non-radial direction due to expansion of the inner wall are at least partly resolved in to tensile or compression components in the said some of said webs.

3,937,603

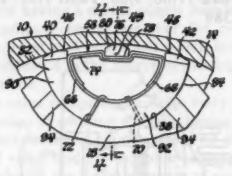
ROTARY MACHINE APEX SEAL

Leonard F. Kopich, Madison Heights, and Gino DiPace, Detroit, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 29, 1974, Ser. No. 501,792

Int. Cl.[2] F01C *19/04*; F04C *27/00*

U.S. Cl. 418—117 2 Claims



1. In a rotary machine, a rotor housing having an internal peripheral wall and oppositely facing end walls, a rotor rotatable between said end walls relative to said peripheral wall, said rotor having apexes that remain adjacent said peripheral wall as said rotor rotates, and seal means for continuously providing sealing between said peripheral wall and each apex of said rotor as said rotor rotates comprising a pair of cylindrical main body segments mounted in a cylindrical slot at each apex of said rotor for pivotal movement in opposite directions about a centerline inside of and adjacent said peripheral wall, each said main body segment having an outer curved edge for engaging said peripheral wall and an inner edge opposite the corresponding edge of the other main body segment, an end segment at each end of each said main body segment and also having an inner edge and mounted in said cylindrical slot for pivotal movement about said centerline, said end segments and adjoining main body segments having mating interfaces angled so that pivotal movement of said end segments in the direction of said peripheral wall also causes movement of said end segments outward against the opposite end wall, and spring means retained in position at each apex on said rotor by said peripheral wall engaging the inner edges of both said main body segments and said end segments for biasing said main body segments in opposite pivotal directions to engage said outer edges with said peripheral wall and also biasing said end segments in opposite pivotal directions so that said mating interfaces wedge said end segments outward against the opposite end wall.

3,937,604

GEAR PUMP OR MOTOR WITH AXIALLY MOVABLE BEARING BLOCKS

John Sassons Taylor, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation of Ser. No. 348,630, April 6, 1972, abandoned. This application Aug. 19, 1974, Ser. No. 498,841

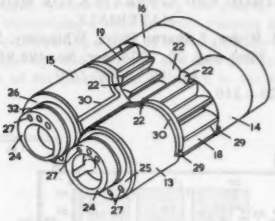
Claims priority, application United Kingdom, Apr. 15, 1972, 17491/72

Int. Cl.[2] F01C *19/08*; F03C *3/00*; F04C *15/00*

U.S. Cl. 418—132 4 Claims

1. A gear pump or motor comprising a housing having a low pressure port and a high pressure port, two pairs of part cylindrical bearing blocks in the housing, said bearing blocks having axial end faces meshed gear elements having axial end faces said gear elements being journalled in the respective pairs of bearing blocks so that the axial end faces of the gear elements are engageable with adjacent end faces of the bearing blocks, one bearing block in each pair being axially movable in the housing, means for limiting the movement of the other bearing block in the pairs in response to pressure on the axial end faces of said movable bearing blocks remote from the gear elements, said blocks having recesses lying adjacent

the respective zones at which the low pressure and high pressure ports open to the inside of the housing, and further recesses in the cylindrical surfaces of the movable bearing blocks which, in conjunction with the housing alone, define passages



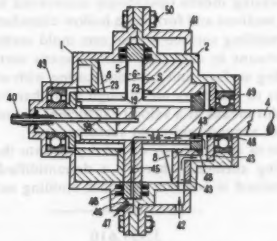
in communication with the high pressure recesses and extending around the cylindrical surfaces of the blocks to locations adjacent the low pressure port and thence axially of the movable bearing blocks to the remote axial end faces thereof.

3,937,605

ROTARY PISTON MACHINE

Ladislav S. Karpisek, 121 Gannons Road, Caringbah, New South Wales, Australia

Filed Feb. 25, 1974, Ser. No. 445,348
Int. Cl.² F01C *19/08*
U.S. Cl. 418—219 **12 Claims**



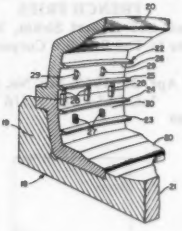
1. In an energy converter including a blade assembly rotatable in a substantially cylindrical chamber defined within a housing; said blade assembly comprising a shaft having a generally uniform diameter along the axial length thereof, a radially extending blade carrying disc having a diameter greater than the diameter of the substantially cylindrical chamber defined by the housing, said blade carrying disc being deposed intermediate the terminal ends of said shaft, a peripheral groove formed in the cylindrical chamber wall of the housing defining said generally cylindrical chamber, said peripheral groove being generally circumferential with respect to the blade carrying disc, said blade carrying disc extending radially into said peripheral groove, at least one slot being formed axially through said blade carrying disc and terminating radially inwardly of the periphery of said disc, a blade being slidably mounted in said slot, said blade including a generally uniform thickness and a generally rectangular configuration described by two sides, two edges and two ends, the length of said blade from one end to the other end being sized to exceed the thickness of said blade carrying disc, said generally cylindrical chamber being at least partially defined by a pair of opposed faced radially extending end walls which are complementarily profiled and formed with centrally disposed recesses for receiving the terminal ends of said shaft axially projecting from either side of said blade carrying disc, the profile of each of said chamber end walls being generally sinusoidal in configuration with equal numbers of peaks and valleys and with the distance between the chamber end walls substantially equal to the length of said blade, and the axial distance between said peaks on the respective chamber and walls being substantially equal to the thickness of said blade carrying disc, the ends of said blade being positioned at a right angle to the shaft axis and engaging the profiled surfaces of said chamber end walls, the inner edge of said blade being positioned to engage the cylindrical surface of said shaft and the outer edge of said blades engaging the cylindrical wall of the housing defining said generally cylindrical chamber, said blade being caused to reciprocate in the axial direction of the shaft in response to rotation of said shaft and the sliding engagement of said blade with the profiled chamber end walls, sealing means being provided for sealing the edges of said blade with respect to the circumferential surfaces of said shaft and of said cylindrical wall defining said generally cylindrical chamber, further sealing means being provided for sealing the sides of said blade with respect to the sides of said slot formed in said blade carrying disc, and an inlet port and an outlet port communicating with the chamber zones defined on either side of said blade carrying disc.

3,937,606

MOLD FOR FORMING TIRES

Marcel J. Morheng, Bertrange, Luxemburg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 3, 1971, Ser. No. 149,491
Int. Cl.² B29H *5/02*
U.S. Cl. 425—28 D **2 Claims**



1. A mold in which tires are molded and vulcanized, comprising:

a. a tread ring, including configured projections integrally cast in the ring for forming correspondingly configured grooves in the tread of a tire being molded and vulcanized in the mold; and

b. a plurality of blades separately shaped apart from the ring and fastened to the ring during the process for forming the finished ring including the projections and blades, each of the blades having a uniform cross-section throughout its height measured from the ring, a non-uniform cross-section throughout the length thereof, and a shape and size sufficient to produce a correspondingly shaped recess in the tread of a vulcanized tire, each of the plurality of blades having opposing extremities which are smaller, in thickness, than a portion of the blade intermediate the extremities.

3,937,607

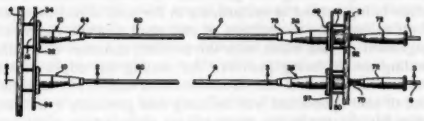
POST-TENSIONING ANCHORS ASSEMBLED IN COMBINATION WITH A SPACER STRIP

George W. Rodormer, Lighthouse Point, Fla., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed July 3, 1972, Ser. No. 268,531
Int. Cl.² B28B *23/04*
U.S. Cl. 425—111 **5 Claims**

1. Apparatus for casting an posttensioning concrete comprising opposed forms between which concrete is cast, a plu-

rality of tendon anchors adjacent to one of said forms, each anchor having a casing with a chuck therein for gripping a tendon, a flexible strip secured to the casings and positioning said casings at predetermined spacings and with the longitudinal axes of the respective casings being perpendicular to said strip, and means secured to said one form for positioning said strip and anchors in spaced relation to said one form and with the strip and said anchors being between said opposed forms,



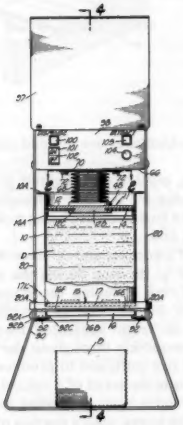
said means and said strip attaching said anchors as a group to said form to position automatically said anchors at said predetermined spacings, which predetermined spacings are substantially the same as the linear distances along said strip between said casings prior to securing said strip and casings to said form, and wherein said casing has an end flange, a thrust plate adjacent to said end flange, said strip is interposed between said thrust plate and end flange, and said securing means passes through said thrust plate and said strip.

3,937,608

MEANS AND TECHNIQUES USEFUL IN PREPARING FRENCH FRIES

David A. Farrant, and Robert Sirkin, both of Northridge, Calif., assignors to The Scionics Corporation, Culver City, Calif.

Filed Apr. 29, 1969, Ser. No. 820,091
Int. Cl.[2] A21C *11/16*
U.S. Cl. 425—159 **28 Claims**



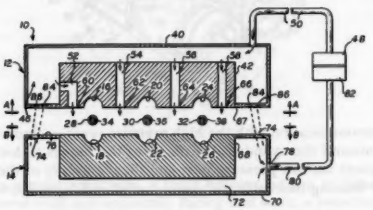
1. In an extruding machine of the character described; a supporting structure including a material storage unit for material to be dispensed; a plunger assembly movably mounted within said material storage unit for movement in a dispensing direction and also in a retract direction opposite to said dispensing direction under the influence of compressive forces developed in the material during prior movement in said dispensing direction; brake means normally maintaining said assembly in stationary condition; means for disabling said brake means; and power operated means for moving said plunger assembly and means for enabling said brake means after said assembly moves a predetermined distance in said retract direction sufficient to allow said compressive forces to be reduced to substantially zero.

3,937,609

METHOD AND APPARATUS FOR MOLDING MATERIALS

Leonard B. Ryder, 5 Sharon Drive, Whippany, N.J. 07981

Filed Aug. 20, 1974, Ser. No. 498,959
Int. Cl.[2] B29C *1/00*
U.S. Cl. 425—210 **12 Claims**



1. An apparatus for molding materials into a molded form comprising, in combination,

a. a first mold section and a second mold section, each section having a molding surface adapted to enclose and contact the material to be molded, said mold sections being in a normally spaced apart position when not cooperating to mold a material;

b. first casing means operatively connected to one of said mold sections and forming a hollow chamber surrounding said molding surface in said one mold section,

c. slot means in said first casing means surrounding said molding surface and communicating with said chamber,

d. means to force dry air through said chamber and out of said slot means at a velocity sufficient to maintain dry air curtain around said mold surfaces, and

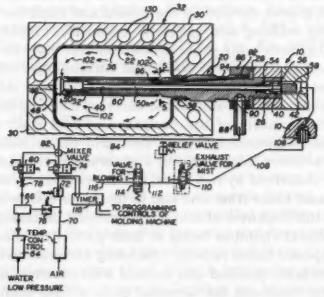
e. means to continuously direct dry air into the area of said molding surfaces whereby a dehumidified gas field is maintained in contact with said molding surfaces.

3,937,610

MIST COOLING OF INSIDE OF BLOWN PLASTIC ARTICLES

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

Filed Dec. 21, 1973, Ser. No. 427,334
Int. Cl.[2] B29D *23/02, 23/03*
U.S. Cl. 425—242 B **14 Claims**



1. Blow molding apparatus for making plastic articles by

blowing a parison on a core rod including in combination a blow mold having a cavity, a core rod that is coated with a parison and that extends into the cavity, a support for the core rod and with which the core rod has relative movement with respect to the blow mold to carry the plastic on the core rod to the blow mold, means for blowing the plastic to form a blown article comprising a blow air inlet passage in the core rod, means for circulating a mist of liquid globules carried by a gas stream through the core rod and into contact with the inside surface of the plastic that is blown in the blow mold cavity, and a source from which said mist is supplied, characterized by the means for circulating the mist including inlet and exhaust passages through the core rod having openings from the core rod into the space enclosed by the article blown in the blow mold, the respective openings of the inlet and exhaust passages being located near opposite ends of the cavity to cause circulation of the mist in the space enclosed by an article blown on the core rod, said mist exhaust passage further comprising the blow air inlet passage for blow molding.

3,937,611

PROCESS FOR THE LEVEL DYEING OF WOOL

Hermann Fuchs, and Hermann-Heinz Konrad, both of Kelkheim, Taunus, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

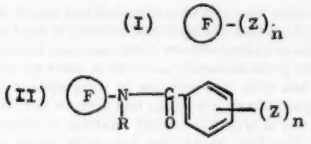
Filed Sept. 6, 1973, Ser. No. 394,800

Claims priority, application Germany, Sept. 8, 1972, 2244089

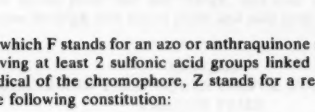
Int. Cl.² C09B *1/00, 5/62;* D06P *3/14*

U.S. Cl. 8—39 R 3 Claims

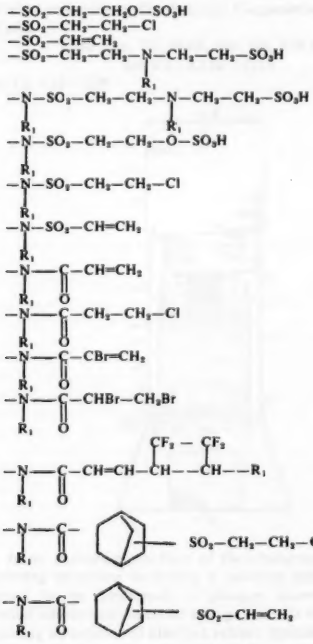
1. A process for the level dyeing of wool, having an anti-felting finish consisting of a coating layer of polyimine or polyamine resin, with reactive dyestuffs, which process comprises carrying out the dyeing according to a graduated temperature exhaustion method from an aqueous liquor using one or several reactive dyestuffs of the formulae



and/or



in which F stands for an azo or anthraquinone dyestuff radical having at least 2 sulfonic acid groups linked to an aromatic radical of the chromophore, Z stands for a reactive group of the following constitution:



(1) $-SO_2-CH_2-CH_2O-SO_3H$

(2) $-SO_2-CH_2-CH_2-Cl$

(3) $-SO_2-CH=CH_2$

(4) $-SO_2-CH_2-CH_2-N(R_1)-CH_2-CH_2-SO_3H$

(5) $-N(R_1)-SO_2-CH_2-CH_2-N(R_1)-CH_2-CH_2-SO_3H$

(6) $-N(R_1)-SO_2-CH_2-CH_2-O-SO_3H$

(7) $-N(R_1)-SO_2-CH_2-CH_2-Cl$

(8) $-N(R_1)-SO_2-CH=CH_2$

(9) $-N(R_1)-C(=O)-CH=CH_2$

(10) $-N(R_1)-C(=O)-CH_2-CH_2-Cl$

(11) $-N(R_1)-C(=O)-CBr=CH_2$

(12) $-N(R_1)-C(=O)-CHBr-CH_2Br$

(13) $-N(R_1)-C(=O)-CH=CH-CH(CF_2-CF_2)-CH-R_1$

(14)

(15)

n is 1 or 2, and R and R_1 each stands for hydrogen atoms or lower alkyl radicals, in the absence of adjuvants and/or without any pretreatment of the material to be dyed.

3,937,612

DIALKYLPHOSPHONOACETYLUREA COMPOUNDS AND PROCESSES FOR PREPARATION AND USE FOR FLAMEPROOFING

Johann Schwarzer, Augsburg; Peter Meins, Haan Rhineland, and Kurt Voparil, Leverkusen, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

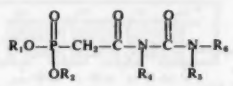
Filed Dec. 26, 1974, Ser. No. 536,305

Claims priority, application Germany, Jan. 5, 1974, 2400393

Int. Cl.² D06M *13/28*

U.S. Cl. 8—186 8 Claims

1. A compound having the formula



wherein R_1 and R_2 are each the same alkyl having 1 to 4 carbon atoms,

R_4, R_5 and R_6 are each selected from the group consisting of alkyl having 1 to 4 carbon atoms, hydroxymethyl and alkoxymethyl having 2 to 5 carbon atoms,

with the proviso that at least one of R_4, R_5 and R_6 is selected from the group consisting of hydroxymethyl and alkoxymethyl having 2 to 5 carbon atoms, and

wherein R_4 and R_5 can together form an alkylene chain having 2 to 3 carbon atoms.

3,937,613

DEVICE FOR THE DETERMINATION OF CHLORINE IN THE WATER OF SWIMMING POOLS

Jan Rosicky, Lindfield, Australia, assignor to Alpha Chemicals (Australia) Pty. Limited, Australia

Filed Apr. 4, 1975, Ser. No. 565,297

Int. Cl.² G01N *31/22, 33/18*

U.S. Cl. 23—253 TP 9 Claims

1. A device for the determination of chlorine in the water of swimming pools comprising a substrate suitably shaped for immersion into a sample of the water to be tested carrying on at least a portion of its surface a layer of a composition comprising an active reagent, selected from the group consisting of para-ethyl-oxyethylamino-aniline and the salts thereof, dissolved or dispersed in a polypropylene-glycol ethoxylate.

3,937,614

APPARATUS FOR MONITORING THE RATE OF A CHEMICAL REACTION

Lester A. Sodickson, Newton, Mass., and Franklin Lim, Richmond, Va., assignors to Damon Corporation, Needham Heights, Mass.

Division of Ser. No. 243,028, April 11, 1972, Pat. No. 3,844,717. This application Aug. 28, 1974, Ser. No. 501,133

Int. Cl.² G01N *21/38, 21/48*

U.S. Cl. 23—253 R 3 Claims

1. An instrument for analyzing liquid material carried in an absorbent article by monitoring a reactant formed from the liquid material in a reaction pad, said instrument comprising:

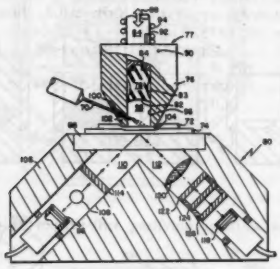
A. a platen member of material transparent to selected radiation and having a first surface for supporting the pad during pressing,

B. pressure means having a pressing surface disposed on a first side of said platen member for compressing the absorbent article between said pressing surface and said first surface of said platen member thereby to press the liquid material from the absorbent article to the reaction pad, and

c. a fluorometer;

1. disposed on the opposite, second side of said platen member,

2. having an optical source for illuminating said first surface through said platen member with incident radiation, and

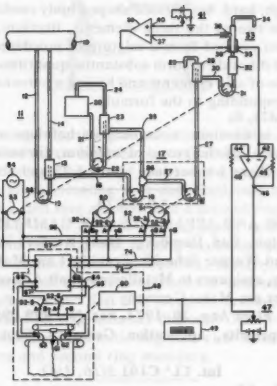


3. having a fluorometric detector in optical alignment with said platen member first surface and said optical source for receiving, through said platen member, radiation emitted adjacent said first surface to response to said incident radiation, whereby analysis of the liquid material proceeds as reactant is developed on said reaction pad.

3,937,615
AUTO-RANGING GLUCOSE MEASURING SYSTEM

Peter J. Clack, Doylestown, and George R. Moreland, Green Lane, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Dec. 17, 1974, Ser. No. 533,553
Int. Cl.² G01N 27/52, 1/14
U.S. Cl. 23—253 R **12 Claims**



1. A system for measuring a characteristic of a solution in which the relationship between a measured variable and the characteristic includes linear and non-linear portions and in which it is desired that the measurement occur in said linear portion comprising:

a source of said solution the characteristic of which is to be measured,

modifying means having an inlet to receive said solution for modifying the characteristic of said solution and an outlet,

measuring means coupled to the output of said modifying means for producing an electric signal output responsive to the characteristic of said solution,

a settable upper limit device for said electrical signal,

a settable lower limit device for said electric signal, the difference between said upper and lower limits defining a usable span representing said linear portion of said relationship,

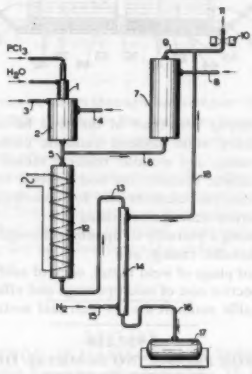
means responsive to said upper and lower limit devices to vary said mdoifying means to maintain said electric signal representative of the characteristic of said solution within said linear portion of said relation, and

indicating means associated with said responsive means for indicating the extent that said characteristic is modified by said modifying means whereby the magnitude of said characteristic of said solution may be determined jointly from said measuring means and said indicating means.

3,937,616
APPARATUS FOR THE MANUFACTURE OF PHOSPHOROUS ACID

Joseph Cremer, Hermulheim, and Willi Martin, Bruhl, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 319,464, Dec. 29, 1972, Pat. No. 3,859,419. This application Oct. 29, 1974, Ser. No. 518,485
Claims priority, application Germany, Jan. 7, 1972, 2200653
Int. Cl.² C01B 25/163; B01J 1/00
U.S. Cl. 23—263 **2 Claims**



1. In an apparatus for producing phosphorous acid from PCl_3 and water including a reactor (2) having a two-opening nozzle (1) mounted thereon, of which the two openings are preferably arranged coaxially with respect to one another and having an orifice relief opening into the reactor (2) for atomizing the PCl_3 thereinto; a steam inlet (4) opening into the reactor (2) laterally with respect thereto for introducing steam thereinto; a conduit (5) connecting the downstream end of reactor (2) with an evaporator (12) and conveying liquid reaction product coming from reactor (2) to evaporator (12) for converting the liquid product to a melt, therein; a further conduit (6) running from the conduit (5) to a separator (7) and delivering escape gas loaded with unreacted, PCl_3 from evaporator (12) to separator (7) of which the upstream end terminates in an off-gas outlet (9) delivering off-gas to a HCl-absorption system; the improvement according to which nozzle (1) is provided with an H_2O-inlet permitting PCl_3 and H_2O to be stream-sprayed jointly into the reactor (2); reactor (2) is provided with an additional steam inlet (3) opening against the orifice relief of nozzle (1) for blowing steam into reactor (2) a stripping column (14) is provided; evaporator

(12) is provided with a conduit (13) running from, and connecting, its downstream end to the upstream end of the stripping column (14), for conveying the melt from evaporator (12) to the stripping column (14); the stripping column (14) is provided at its downstream end with a gas inlet (15) opening thereinto for blowing inert gas through the melt therein; and further provided at its downstream end with an effluent outlet (16) for conveying the melt to a crystallizer (17); and connected to off-gas outlet (11) by means of a conduit (18) running from the upstream end of column (14) to off-gas outlet (11) at a place between the separator (7) and a photoelectric safety device (10) monitoring and inspecting the clearness of the off-gas.

3,937,617
CATALYTIC CONVERTER FOR AUTOMOTIVE INTERNAL COMBUSTION ENGINE

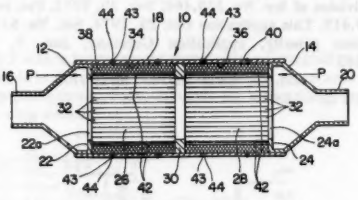
Hiroshi Yaguchi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed July 10, 1974, Ser. No. 487,367

Claims priority, application Japan, July 11, 1973, 48-82287[U]

Int. Cl.² B01J 8/00; F01N 3/15

U.S. Cl. 23—288 FC **6 Claims**



1. In a catalytic converter of the type having a metallic casing; a unitary, solid skeletal catalytic element disposed within said casing; and metallic resilient means disposed between said catalytic element and said metallic casing for positioning said catalytic element and for absorbing mechanical shocks; the improvement comprising:

means defining a plurality of openings through a lateral wall of said metallic casing; and

a plurality of plugs of weld metal, each of said plugs formed in a respective one of said openings and effective to bond said metallic resilient means with said metallic casing.

3,937,618
METHOD FOR PRODUCING BI-METAL OBJECT AND PRODUCT THEREOF

Kathleen E. Kirkham, Drexel Hill, Pa., assignor to Franklin Mint Corporation, Franklin Center, Pa.

Filed July 9, 1973, Ser. No. 377,378

Int. Cl.² B22F 1/00, 7/00

U.S. Cl. 29—182.2 **17 Claims**

1. A method of making a bi-metal object having a base and at least one area raised in relief on said base, said relief being formed of a first metal and said base being formed of a second metal with a sharp border between the two metals, the steps comprising:

a. providing a first die cavity which is the negative of the relief to be formed;

b. filling said first die cavity with a powder of said first metal;

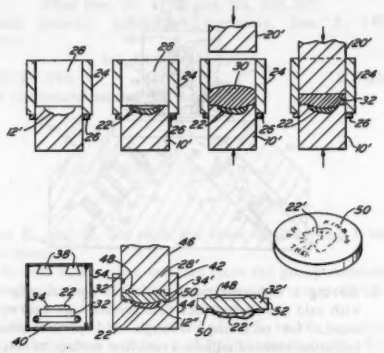
c. compacting said first metal powder in said first die cavity to form a cohesive relief compact and removing any excess metal from the edges of said compact;

d. providing a phantom die area which is the negative of said base and having a second die cavity identical to said first die cavity, said second die cavity being positioned at the bottom of said phantom die area, and said relief compact being seated within said second die cavity;

e. filling the remainder of said second die cavity above said relief compact and partially filling said phantom die area with a powder of said second metal;

f. compacting said second metal powder to form a composite with said relief compact;

g. sintering said composite at a temperature and for a time



sufficient to produce a durable bi-metal object, but insufficient to produce any significant dimensional change in said composite; and

h. striking the final design of said base in a coining press, the bottom die of said press having a coining die cavity identical in configuration and position to said second die cavity

3,937,619
TERNARY BORIDE PRODUCT AND PROCESS

Edward V. Clougherty, West Roxbury, Mass., assignor to Manlabs, Incorporated, Cambridge, Mass.

Filed Sept. 27, 1973, Ser. No. 401,291

Int. Cl.² B22F 3/14; C22C 1/05

U.S. Cl. 29—182.5 **9 Claims**

1. A tough, hard, hot pressed shaped body containing boron and at least two of the three elements, titanium, zirconium, hafnium, hot pressed from a mixture of powdered metal and a powdered diboride to form substantial quantities of a ternary monoboride of said elements and having a percentage composition corresponding to the formula

$$(M1, M2)_x B_2$$

where M1 is titanium, zirconium or hafnium and M2 is a different metal of the group of titanium, zirconium and hafnium, and where x is between about 1.25 and about 2.5.

3,937,620
PROCESS AND APPARATUS FOR GASIFYING COAL

Paul Rudolph, Bad Homburg; Hans Kupfer, Frankfurt am Main, and Werner Schmidt, Frankfurt am Main-Sud, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 20, 1974, Ser. No. 499,095

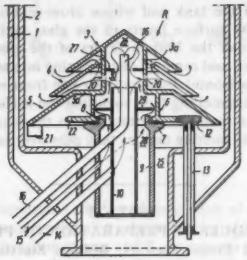
Claims priority, application Germany, Sept. 18, 1973, 2346833

Int. Cl.² C10J 3/16, 3/42

U.S. Cl. 48—63 **11 Claims**

1. Reactor for continuously gasifying coal under elevated pressures and temperatures with, as gasifying agents, oxygen and at least one oxygen-free gasifying agent such as water vapor or carbon dioxide, said reactor comprising a rotary grate rotatably mounted on bearing means, said grate distributing said gasifying agents into said reactor, said rotary grate containing a mixing chamber having openings to release a mixture of said gasifying agents into the coal charge to be gasified, conduit means for supplying a mixture of oxygen and an oxygen-free gasifying agent to said mixing chamber, a lower chamber in said grate below and communicating with

said mixing chamber, said lower chamber being adjacent the bearing means for said rotary grate, and further conduit means

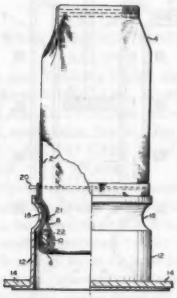


for supplying an oxygen-free gasifying agent to said lower chamber.

3,937,621
FILTER BAG CUFF

Mark L. Gravley, Oregon, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1974, Ser. No. 526,943
Int. Cl.[2] B01D *46/02*; D05B *97/00*
U.S. Cl. 55—377 **14 Claims**



12. A filter bag comprising an essentially tubular, elongated fabric body, said fabric body having a first and a second end, said first end being closed and said second end being open, said second end terminating in a cuff, said cuff having disposed therein a first ring member and a second ring member, said cuff having been formed by emplacing said first ring member around said bag and turning back the edge of said second end over said first ring member, thereby forming a cuff, emplacing said second ring member around said bag above said cuff-enclosed first ring member, turning back said cuff having said first ring member disposed therein over said second ring member, and stitiching said cuff to said bag between said first and second ring members.

3,937,622
AIR PURIFIER SYSTEM

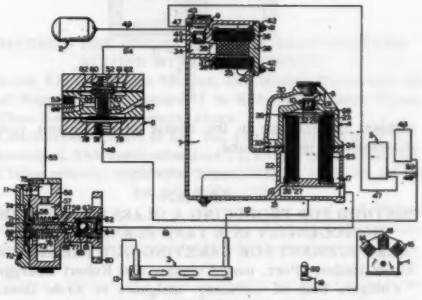
William J. Hewitt, Monroeville; Frank W. Shirey, Irwin, and Mortimer D. Wilson, Turtle Creek, all of Pa., assignors to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Sept. 17, 1973, Ser. No. 397,703
Int. Cl. B01d *53/04*
U.S. Cl. 55—163 **16 Claims**

1. Cleansing apparatus for a filter unit of the desiccant type disposed in a conduit connecting a fluid compressor to a storage reservoir, said cleansing apparatus comprising:

a. a purge reservoir charged with fluid under pressure delivered by the fluid compressor, wherein the improvement comprises:

b. a fluid pressure operated combined compressor unloading and backflow vent valve device operable by fluid under pressure from said purge reservoir to concurrently effect a release of fluid under pressure from the conduit and a supply of fluid under pressure from said purge reservoir through the filter unit to atmosphere in a direction opposite to the normal direction of flow of fluid



under pressure therethrough to remove contaminants from and thus reactivate the desiccant in said filter unit until the pressure in the purge reservoir is reduced to a chosen low pressure, and

c. fluid pressure operated means effective upon the pressure in the storage reservoir reaching a chosen value to cause the flow of fluid under pressure from said purge reservoir to said fluid pressure operated combined compressor unloading and backflow vent valve device to effect operation thereof.

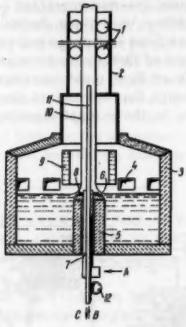
3,937,623
METHOD OF MAKING GLASS TUBES

Vasily Porfirovich Kononko, ulitsa Semashko, 21, kv. 43, Kiev; Konstantin Timofeevich Bondarev, ulitsa Nizhnyaya Pervomaiskaya, 33, kv. 171, Moscow; Alexandr Alexandrovich Krivokon, Bereznyakovksaya ulitsa, 14, kv. 83, Kiev; Nikolai Nikiforovich Kovshar, Steklozavodskaya ulitsa, 8, kv. 25, Kievskaya oblast, poselok Bucha; Ljudmila Mikhailovna Ivanova, Bereznyakovskaya ulitsa, 14, kv. 18, Kiev; Elena Gavrilovna Frolova, Leningradskoe shosse, 118, korpus 1, kv. 108, Moscow; Nikolai Antonovich Shestak, ulitsa Serafimovicha, 7, kv. 127, Kiev, and Nikolai Leontievich Shevchenko, Steklozavodskaya ulitsa, 6, kv. 17, Kievskaya oblast, poselok Bucha, all of U.S.S.R.

Filed July 25, 1973, Ser. No. 382,560
Int. Cl.[2] C03B *15/14*
U.S. Cl. 65—88 **6 Claims**

1. A method of making a glass tube comprising the following steps: the upright drawing of a melt from the free surface of the melt; supplying air to the inside of the tube being made; imparting geometric form to said tube under the effect of said air which is heated in a forming section; effecting a continuous vertical transfer of the tube being formed; annealing the tube being formed by causing a movement of cooling fluid in an annealing section spaced above the forming section for effect-

ing concurrent cooling of said tube from the inside in the annealing section and subsequent cooling of the tube to an



ambient temperature in the course of continuous vertical movement of the said tube.

3,937,624

METHOD FOR PRODUCING A GLASS FLOW OF HIGH HOMOGENEITY IN A TANK FURNACE AND AN ARRANGEMENT FOR CARRYING OUT THE METHOD

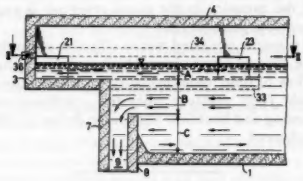
Xaver Heitzer, Porz, near Cologne, and Robert Bourggraff, Cologne, both of Germany, assignors to Erste Deutsche Floatglas GmbH. & Co. OHG, Germany

Filed Dec. 5, 1974, Ser. No. 529,845

Claims priority, application Germany, Dec. 17, 1973, 2362565

Int. Cl.[2] C03B 5/26

U.S. Cl. 65—135 20 Claims



1. A method for producing a glass flow of high homogeneity in a tank furnace in which the surface layer of the glass melt is separated from the glass flow intended for processing, characterized in that within the working part of the tank, which contains the refined glass, at a removal point spaced upstream from the downstream end wall of the tank, a selected layer of glass underneath the surface layers and above the bottom layers is drawn off, at least in part, and supplied to the processing station, while said surface layers above said selected layer are allowed to pass on downstream beyond said removal point and are returned from a point in the tank downstream of said removal point to a point upstream from said removal point, said bottom layers below said selected layer also being returned to a point upstream from said removal point.

14. A glass melt tank for effecting the selected separation of a layer of molten glass located intermediate the top and bottom surface layers of the melt tank, said melt tank comprising: an upstream end away from which glass is intended to flow and a downstream end towards which glass is intended to flow; an upper end wall at said downstream end, against which the upper layers of glass flow as they flow downstream in said tank; a pair of spaced side walls and a bottom; a removal duct leading out of the melt tank for conducting the flow of molten glass to a processing station, said removal duct leading out of the melt tank for conducting the flow of molten glass to a processing station, said removal duct including an opening into said tank whose cross-section in its vertical extent is substantially less than the vertical extent of the normal glass bath level for the tank and whose cross-section is arranged underneath the surface layers of the glass melt to be eliminated and above the bottom layers of the glass melt to be eliminated; and said removal duct opening into said tank being spaced at a horizontal distance upstream from said upper end wall of the glass melting tank such that the surface layer glass currents in the tank run substantially in the longitudinal flow direction of the melting tank as they pass over said opening of said duct.

3,937,625

RADIO FREQUENCY PREPARATION OF PURE GLASS

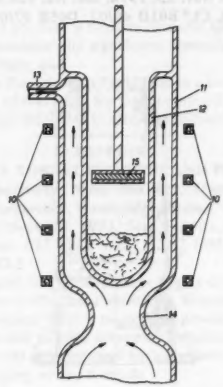
Clive Edward Ernest Stewart, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 2, 1974, Ser. No. 494,155

Claims priority, application United Kingdom, Aug. 30, 1973, 40890/73

Int. Cl.[2] C03B 5/16, 5/22, 5/02

U.S. Cl. 65—136 4 Claims



1. A method of preparing glass including placing glass batch materials in a crucible, inserting an encapsulated contamination-free susceptor into the crucible, applying a radio frequency field to heat the susceptor to melt the glass, removing the susceptor and applying said radio frequency field to further heat the melt for fining and homogenizing the glass, and cooling the crucible with liquid to provide a lower temperature than the melt to prevent the melt from wetting the crucible.

3,937,626

AGENTS FOR REGULATING PLANT METABOLISM

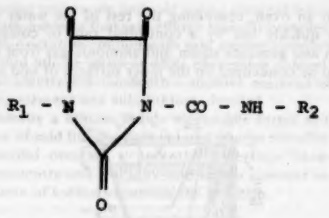
Toni Barlocher, Oberwil, Switzerland, and Edith Ebert, Lorrach-Stetten, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 288,640, Sept. 13, 1972, Pat. No. 3,818,034. This application Apr. 3, 1974, Ser. No. 457,523

Int. Cl.[2] A01N 9/22

U.S. Cl. 71—92 6 Claims

1. A composition for regulating plant metabolism in the nature of promoting fruit abscission comprising as active ingredient, an effective non-phytotoxic amount of a compound of the formula



wherein R_1 represents alkyl or alkenyl each of up to 4 carbon atoms or phenyl optionally substituted by chlorine, nitro or alkyl of 1 to 4 carbon atoms, and R_2 represents alkyl or alkenyl each of up to 4 carbon atoms, together with a suitable inert carrier therefor.

3,937,627

PERCHLORYLPHENYLUREA HERBICIDE

Kurt H. G. Pilgram, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 381,936, July 23, 1973, abandoned. This application Feb. 19, 1975, Ser. No. 551,172

Int. Cl.² A01N *9/20*

U.S. Cl. 71—120 **4 Claims**

1. 1-methoxy-1-methyl-3-(3-perchlorylphenyl)-urea.

3,937,628

SOLID-SOLUTION STRENGTHENED AUSTENITIC ALLOYS

Rikizo Watanabe, and Yositaka Chiba, both of Yasugi, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Apr. 3, 1974, Ser. No. 457,501

Claims priority, application Japan, May 30, 1973, 48-65766

Int. Cl.² C22C *19/00*

U.S. Cl. 75—134 F **10 Claims**

1. A solid-solution strengthened austenitic alloy having excellent high-temperature strength consisting essentially of, in weight percent, no more than 0.1 % carbon, from 4 (%C) to 1 % titanium and/or niobium (alone or in combination), from 25 % to 55 % cobalt, from 10 % to 22 % chromium, from 13 % to 25 % tungsten, wherein the amount of 1/5 (%Co) + (%Cr) + (%W) is in the range from 40 % to 44 %, and the balance nickel except for impurities, the amount of carbon being sufficient to form MC type carbides with the titanium and niobium.

3,937,629

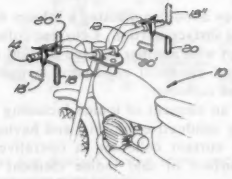
HANDLEBAR EXTENDER

Paul A. Hamasaka, 2322 Amherst Ave., Los Angeles, Calif. 90064

Filed Sept. 23, 1974, Ser. No. 508,382

Int. Cl.² B62K *21/12*

U.S. Cl. 74—551.8 **4 Claims**



1. A handlebar extender, comprising as a single integral unit a bracket formed to rotatably encircle said handlebar at an end thereof to define a pivot plane thereabout, and an extension member comprising an elongate rod rigidly joined to said bracket, said rod being bent to form a first portion projecting outwardly from said bracket in said pivot plane and a return portion bent about 180° and continued as a substantially parallel portion to contact said first portion on one side thereof to form a hand grip, said extender further comprising means for securing said bracket against rotatable movement on said handlebar.

3,937,630

METHOD FOR PRODUCING IRON-BASE SINTERED ALLOYS WITH HIGH DENSITY

Takashi Kimura; Azusa Majima, and Hiroshi Hamamoto, all of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Continuation-in-part of Ser. No. 142,556, May 12, 1971, abandoned. This application June 11, 1973, Ser. No. 369,123

Claims priority, application Japan, May 12, 1970, 45-40820

Int. Cl.² B22F *1/00*

U.S. Cl. 75—200 **7 Claims**

1. A method for producing a sintered product of iron-base alloy having a high density and high hardness consisting essentially of:

placing a mixture of a particulate material selected from the group consisting of mixed particles of iron and carbon, mixed particles of iron and other metal, mixed particles of iron, other metal and carbon, and particles of an iron-base alloy in a suitable mold, wherein said other metal is selected from the group consisting of manganese, tungsten, molybdenum, chromium, vanadium, niobium and tantalum,

heating said mixture to a temperature such that an alloy consisting of said particulate mixture will form a coexistent liquid and solid phase,

maintaining said temperature for a period sufficient to cause sintering,

cooling said sintered product in said mold, and thereafter removing said product in solid phase from the mold.

3,937,631

ELECTROPHOTOGRAPHIC MEMBERS INCLUDING POLYVINYLCARBAZOLES AND PLASTICIZERS THEREFORE

Wolfgang O. Eisenhut, Woodside, Calif., assignor to SCM Corporation, New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,440

Int. Cl.² G03G *5/04*, *5/06*

U.S. Cl. 96—1.5 **17 Claims**

1. In a multilayer electrophotographic member for producing an electrostatic latent charge image thereon:

a layer of photoconductive material;

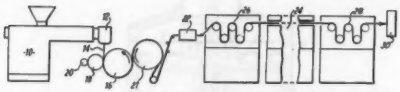
a layer of organic polymeric material overlying said photoconductive layer and having the ability to transport electrical charge carriers therethrough, said layer of organic polymeric material having incorporated therein a plasticizer material selected from the group consisting of oligomers of phenylether, and derivatives of phenylether with at least one aryl substituent attached to the aromatic nuclei, the plasticizer being present in a concentration within the range of 1 to 100 parts of plasticizer per hundred parts of the organic polymeric material by weight.

3,937,632

METHOD FOR BRIGHTENING AND WHITENING CLAYS UTILIZING SODIUM BOROHYDRIDE

Alan J. Nott, Tennille, Ga., assignor to Anglo-American Clays Corporation, Sandersville, Ga.

Filed June 11, 1974, Ser. No. 478,352
Int. Cl.² C04B 33/13; C01F 1/00
U.S. Cl. 106—72 5 Claims



1. A method for brightening and whitening a kaolin clay comprising in sequence the steps of:

forming said clay into an aqueous slurry;

mixing said aqueous slurry with a solution of sodium borohydride and sodium hydroxide, while maintaining a pH of above 7.0 and up to about 10.0;

contacting said slurry with gaseous sulphur dioxide in sufficient quantities to bring said slurry to a pH of between 6.0 and 7.0; said sulphur dioxide reacting with said sodium borohydride and sodium hydroxide to yield sodium hydrosulfite, and the quantities of said sodium borohydride and said sodium hydroxide being sufficient to yield a reacted equivalent of between 2 and 12 lbs/ton of slurry, of sodium hydrosulfite;

adjusting the pH of the slurry to between 2.5 and 4.0, to facilitate said leach reaction;

the temperature of the system being maintained within the range of 25° to 45°C; and

washing the clay free of residual leaching agents and reaction products.

3,937,633

USE OF RADIATION-INDUCED POLYMERS IN CEMENT SLURRIES

Bruce L. Knight; John S. Rhudy, and William B. Gogarty, all of Littleton, Colo., assignors to Hercules, Incorporated, Wilmington, Del.

Division of Ser. No. 303,736, Nov. 6, 1972, Pat. No. 3,877,525. This application Nov. 21, 1973, Ser. No. 418,158
Int. Cl.² C04B 7/02
U.S. Cl. 106—90 17 Claims

1. A cement slurry comprised of a water phase containing a polymer obtained as a product of high energy ionization radiation polymerization of at least one monomer selected from the group consisting of acrylamide and methacrylamide and at least one monomer selected from the group consisting of acrylic acid, methacrylic acid, alkali metal acrylate, and alkali metal methacrylate in concentrations of about 10% to about 60% by weight dissolved monomer in an aqueous medium, the radiation intensity being about 250 to about 1,000,000 rads and the radiation dose being about 500 rads to about 300,000 rads.

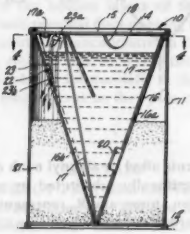
3,937,634

OVEN CLEANING PROCESS

Alan D. Brite, 114 S. Canyon View Road, Los Angeles, Calif. 90049

Continuation-in-part of Ser. No. 297,720, Oct. 16, 1972, abandoned. This application May 3, 1974, Ser. No. 466,786
Int. Cl.² B08B 9/00
U.S. Cl. 134—2 7 Claims

1. A method for cleaning ovens and the like comprising the steps of adding water to a container of a substantially uniform mixture of calcium oxide and ammonium salt, permitting a small amount of the water to initially combine with the mixture to initiate an exothermic reaction, enclosing said container in an oven, combining the rest of the water with the mixture quickly but by a controlled rate to complete the reaction and generate steam and ammonia gas from the container to be condensed on the inner surfaces of said oven and



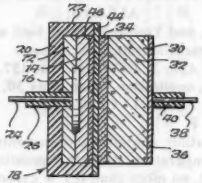
removing said condensate from said oven surfaces, said mixture of calcium oxide having a sufficiently fine particle size whereby mix generation of steam and ammonia gas from the container occurs within a time period of about between 3–7 minutes.

3,937,635

LITHIUM-IODINE BATTERY

Ralph T. Mead, Kenmore, and Wilson Greatbatch, Clarence, both of N.Y., assignors to Wilson Greatbatch, Clarence, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,731
Int. Cl.² H01M 4/36
U.S. Cl. 136—83 R 13 Claims



1. In a lithium-iodine cell including a lithium anode and a lithium iodide electrolyte, a cathode comprising:

a. an element of iodine having an additive of electrically conductive material;

b. a layer of material comprising a charge transfer complex of an organic donor component and iodine on a surface of said iodine element, said layer being operatively adjacent said lithium anode for supplying iodine to said electrolyte; and

c. barrier means penetrable by said charge transfer complex material and located between said layer and said lithium anode for preventing contact between said anode and said additive of electrically conductive material of said iodine element prior to formation of said electrolyte.

10. A method of making a lithium-iodine cell comprising the steps of:

a. providing an anode comprising a lithium element having an exposed surface portion, a current collector in operative contact with another surface portion of said lithium element and electrical conductor means connected to said current collector;

b. providing an element of iodine including an additive of electrically conductive material and having an operative surface, a current collector in operative contact with another surface of said iodine element and electrical conductor means connected to said current collector;

c. coating said operative surface of said iodine element with material comprising a charge transfer complex of an organic donor component and iodine; and

d. placing said anode and said iodine element into operative relationship so that said charge transfer complex material is in operative contact with said exposed surface portion of said lithium element while preventing contact between said electrically conductive additive material of said iodine element and said lithium element;

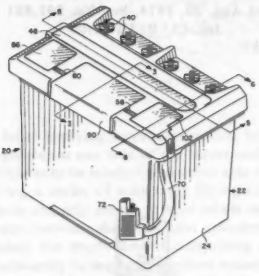
e. whereby a lithium iodide electrolyte forms at the interface of said lithium element and charge transfer complex material creating a potential difference between said conductors and whereby said iodine element serves as a source of iodine to sustain the reaction.

3,937,636

BATTERY WITH RECESSED TERMINALS AND FUSE

Robert C. Slautterback, Toledo, Ohio, assignor to Eltra Corporation, Toledo, Ohio

Filed June 12, 1975, Ser. No. 586,432
Int. Cl.² H01M 2/30
U.S. Cl. 136—135 S 17 Claims



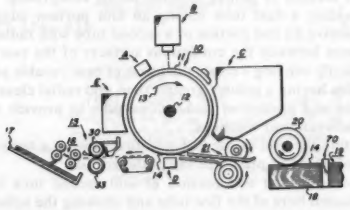
1. A battery comprising a case, said case including recess means, first and second terminals extending into said recess means, first conductor means connected to said first terminal and extending out of said recess means, said first conductor means including a fuse disposed in said recess means, second conductor means connected to said second terminal and extending out of said recess means, and means for substantially covering said recess means.

3,937,637

ROLL CONTACT FUSER

Rabin Moser, Fairport, and John G. Ruhland, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 27, 1973, Ser. No. 383,231
Int. Cl.² B32B 15/04
U.S. Cl. 148—6 30 Claims



1. Apparatus for contact fusing toner particles to a substrate, said apparatus comprising:

an internally heated structure comprising a rigid core of a high surface energy material selected from the group consisting of glass and metal and a coating of a polymer release material on said core, said polymer release material being the type which oxidizes and is capable of reacting with the core surface material, said coating comprising a first barrier coating portion in contact with said core surface, said first portion being formed during operation of the apparatus at the interface of the core surface and the polymer release material, the first portion having a greater affinity for the core surface material than the toner particles and thereby preventing toner particles from contacting the core, and a second replenishing release portion continuously applied, the release portion being the polymer release material and having a cohesive force which is less than the adhesive forces between the toner particles and the substrate and the cohesive forces of the toner particles, said coatings having a combined thickness of less than 1 micron; and

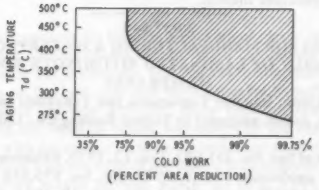
a backup member cooperating with said heated structure to form a nip through which said substrate passes with said toner particles contacting said heated structure.

3,937,638

METHOD FOR TREATING COPPER-NICKEL-TIN ALLOY COMPOSITIONS AND PRODUCTS PRODUCED THEREFROM

John Travis Plewes, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 296,011, Oct. 10, 1972, abandoned.
This application July 26, 1974, Ser. No. 492,007
Int. Cl.² C22F 1/08
U.S. Cl. 148—12.7 10 Claims



1. A method for producing a copper-nickel-tin alloy comprising cold working and aging characterized by

a. providing an alloy consisting essentially of a composition within the single phase α region of the equilibrium ternary phase diagram for copper, nickel and tin at temperatures approaching the melting point of the alloy but within the two-phase $\alpha + \theta$ region of the diagram at room temperature, in a supersaturated solid solution of α phase having medium to fine grain size,

b. cold working the alloy by an amount equivalent to an area reduction of at least 75 percent, and

c. aging the alloy at a temperature below the metastable boundary T_m of the alloy, T_m being defined as the temperature at which curves produced by isothermal resistivity changes as a function of time revert from a sigmoidal to an exponential character.

3,937,639

PROCESS FOR THE BRIGHT ANNEALING AND RECRYSTALLIZATION OF NON-FERROUS METALS

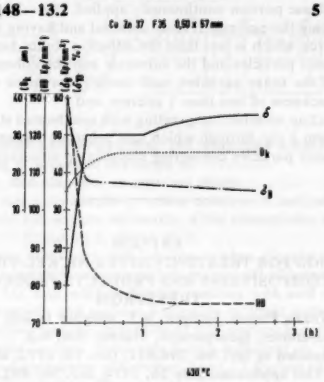
Werner Romer, Dellinghofen, and Rolf Orthey, Ludenscheid, both of Germany, assignors to Busch-Jaeger Ludenscheider Metallwerk GmbH, Ludenscheid, Germany

Filed Oct. 4, 1974, Ser. No. 512,326

Claims priority, application Germany, Oct. 9, 1973, 2350625

Int. Cl.² C22F *1/08*

U.S. Cl. 148—13.2 5 Claims



1. In a process for the bright-annealing and recrystallization of copper-zinc alloy articles in the form of strip, wire and bar material, in which such articles are heated to recrystallization temperature in an air atmosphere in an annealing furnace, the improvement which comprises applying to such articles a coating of a liquefied synthetic resin dissolved in a solvent therefor and introducing the thus coated articles into the annealing furnace and subjecting the articles to recrystallization temperature therein.

3,937,640

PROCESS FOR MANUFACTURING A WATERPROOFING ASSEMBLY OF LAMINATED BITUMINOUS ROOFING MEMBRANES

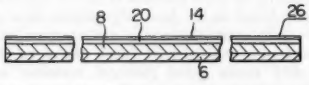
Eiichi Tajima; Kaname Yamamoto, and Takayoshi Imai, all of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Division of Ser. No. 331,602, Feb. 12, 1973, abandoned. This application May 8, 1975, Ser. No. 575,538

Claims priority, application Japan, Feb. 19, 1972, 47-16906

Int. Cl.² E04B *7/00*

U.S. Cl. 156—71 3 Claims



1. A process for manufacturing a built-up bituminous roofing or waterproofing assembly, utilizing a self-adhesive, multilayer, laminated, bituminous roofing membrane, comprising a flexible base sheet having on at least a portion of one surface thereof a first surface coating layer of uniform thickness applied in direct face-to-face mutually adhering contact therewith, said first surface coating layer consisting essentially of a substantially solid, waterproofing roofing bitumen; a second surface coating layer of uniform thickness superposed on said first layer and having its inner surface in direct, face-to-face, mutually cohering contact with the outer surface of said first surface coating layer, said second coating layer being of lesser thickness than said first coating layer and consisting essentially of a compound bitumen containing from about 5 to 95 percent by weight of substance selected from the group consisting of rubber, thermoplastic resin and mixtures thereof, said compound bitumen being of high tackiness at ambient temperature and being self-adhesive to the compound bitumen layer of another like roofing membrane; and a release sheet having a release surface in direct face-to-face releasably adhering contact with the outer surface of said second coating layer, comprising the steps of

a. laying a plurality of said roofing membranes over a substrate so that said membranes partially overlap,

b. removing the release sheets from the roofing membranes to expose the second layers thereof,

c. placing said second layers in direct face-to-face contact and pressing said second layers together to form a waterproof joint therebetween.

3,937,641

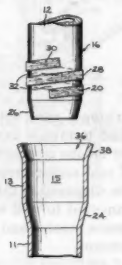
METHOD OF ASSEMBLING ADHESIVE JOINT

Gerald J. Kushner, and William D. Irish, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 30, 1974, Ser. No. 501,881

Int. Cl.² B65H *81/00*

U.S. Cl. 156—87 4 Claims



1. A method of joining metallic tubing comprising:

providing a first tube having an end portion adapted to receive an end portion of a second tube with radial clearance between the contiguous surfaces of the two tubes;

helically winding a single thickness of heat curable adhesive film having a volume greater than said radial clearance to the end portion of said second tube to provide a space between said windings;

heating the end portion of said first tube to a temperature sufficient to plasticize said adhesive film;

telescoping the end portion of said second tube into the heated bore of the first tube and allowing the adhesive on said second tube to plasticize and spread into the radial clearance between the contiguous surfaces of the tubes while air entrapped during the spreading of said adhesive escapes between the helical winding and past the open end of said second tube; and

heating said telescoped joint to a temperature sufficient to cure said adhesive.

3,937,642

LABELING DEVICE WITH AN INSTALLATION FOR MARKING LABELS

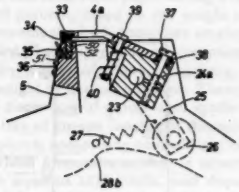
Hermann Kronseder, Neutraubling, and Franz Wetter, Regensburg, both of Germany, assignors to Hermann Kronseder, Neutraubling, Germany

Division of Ser. No. 381,184, July 20, 1973, Pat. No. 3,893,388, which is a continuation of Ser. No. 223,204, Feb. 3, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,320

Claims priority, application Germany, Feb. 20, 1971, 2108256; Apr. 24, 1971, 2120241; July 17, 1971, 7127471

Int. Cl.² B41L *21/06*

U.S. Cl. 156—384 6 Claims



1. In a label applying turret for picking labels from an extraction cylinder at one side of the turret and transferring the labels to objects to be labeled at another side of the turret, said turret having a series of outwardly facing label transfer and support pads and grip means to hold labels on the pads as the turret rotates between the extraction cylinder and the objects to be labeled, the improvement comprising a corresponding series of outwardly facing label markers mounted on the turret adjacent to and substantially flush with said pads, each label marker being associated with a corresponding pad whereby respective labels gripped by the grip means and carried by said pads also lie against associated adjacent markers, and inwardly pressing means for pressing the labels against the markers to cause marked impressions on the labels in the course of transfer of the labels from the extraction cylinder to the objects to be labeled, said pressing means and grip means together comprising a corresponding series of label gripping fingers aligned with the markers and means for biasing the fingers toward the markers whereby the fingers concurrently grip the labels and press them against the markers.

3,937,643

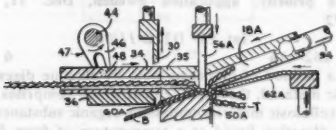
METHOD AND MEANS OF TUFTING

Abram N. Spanel, 344 Stockton St., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 419,417, Nov. 27, 1973, which is a continuation of Ser. No. 239,931, March 31, 1972, abandoned. This application Dec. 23, 1974, Ser. No. 535,804

Int. Cl.² D04H *11/00*

U.S. Cl. 156—435 6 Claims



1. Apparatus for producing a product by adhesively securing yarn bits to an adhesive backing layer comprising pneumatic means for conveying yarn to a bit-applying station having a passageway extending from the source of yarn to said bit-applying station, means for supplying said adhesive backing to said bit-applying station, and means for severing yarn that extends longitudinally within the passageway, wherein the passageway comprises parts relatively movable to one another between a first relationship in which access is provided to the yarn for said severing means, and a second relationship in which the passageway is substantially continuous between its ends for conveying of said yarn, means to cause relative movement of said movable passageway parts to open and close said access; said bit-applying station further comprising a combination bit-applying and clamping means reciprocable to and from said backing layer between a position in which yarn is received from said passageway and a position in which said yarn is clamped against said backing layer, and wherein clearing means are provided to clear tufted yarn out of the path of the combination bit-applying and clamp means.

3,937,644

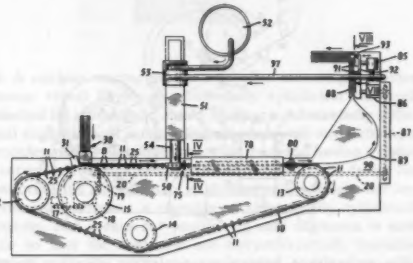
APPARATUS FOR APPLYING A BACKING OF PLASTIC MATERIAL TO A CUTTING BLADE

Claude A. Bergeron, and Hubert L. Smith, both of Staunton, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 31, 1974, Ser. No. 519,562

Int. Cl.² B32B *31/18;* B65G *15/30*

U.S. Cl. 156—498 7 Claims



1. An apparatus for forming a backing of plastic material on an edge of cutting blades comprising a continuous conveyor belt, means for driving the belt, means for depositing blades seriatim on the belt, said belt having lugs on its surface forming spacers between adjacent blade ends on said belt, an extrusion die through which said belt with the blades is advanced with means for forming a continuous strip of the plastic material with the edge of the blades fully imbedded therein, and cooling means through which the strip is fed from the extrusion die.

3,937,645

HEAT SEALING APPARATUS

Fred Ascoli, Maryland Heights, and Robert R. Hermann, Ladue, both of Mo., assignors to Standard Container Company, St. Louis, Mo.

Filed Jan. 11, 1974, Ser. No. 432,682

Int. Cl.² B32B *31/00;* B65B *7/28*

U.S. Cl. 156—522 1 Claim

1. In an apparatus for heat sealing a plastic film cover to an open container having laterally extending, opposed margin portions defining the container opening:

a. a base,

b. support means for the container, the support means including an upper seating portion receiving the container margin portions in seating relation,

c. mounting means for supporting a roll of film for withdrawal of the film across the container margin portions,

d. a lever pivotally mounted for swinging movement relative to the base,

e. a sealing head carried by the lever above the support means, in spaced relation to the pivotal mounting of the lever, for swinging movement of said head into clamping

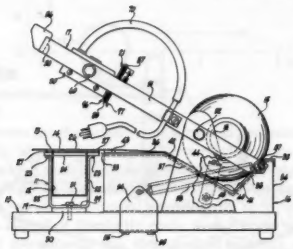
engagement with the film on the container margin portions, the sealing head including:

1. a heated platen having opposed margin portions substantially in register with the container margin portions when the film is clamped for heat sealing, each heated platen margin portion including a first groove portion located laterally outward of the container opening, the first groove portion being peripherally continuous to provide a complete seal inwardly thereof, and a second groove portion spaced outwardly of and substantially parallel to the said first groove protion to provide an elongate land therebetween, the land providing a seal between the first and second groove portions,

f. cutter means carried by the lever for severing the film drawn across the container from the roll,

g. the support means and the mounting means cooperating to provide spaced abutment portions rearwardly disposed of the container and engageable by the film, said abutment portions defining a gap therebetween and said film extending across said gap,

h. the cutter means including a blade carried by the sealing head and rigidly fixed relative to the sealing head and



lever, the blade being movable into the gap to cut the film as the head is moved by the lever into engagement with the film, and spaced clamping elements mounted in movable relation to and on the blade, one clamping element being located adjacent each side of the blade, each clamping element having a lower clamping margin engageable with the film against an associated abutment portion to clamp the film across the gap as the head is moved by the lever into engagement with the film, and resilient means between the blade and clamping elements tending to urge the lower clamping margins below the blade so that the clamping margins will engage and clamp the film and then permit the blade to move below the lower clamping margins to cut the film, all under loading of the resilient means, in sequence by moving the head with the lever into engagement with the film,

i. the blade including a transversely projecting lug,

j. the clamping elements forming a substantially U-shaped blade, and the shield including a transversely projecting lug, and

k. the resilient means including a tension spring extending between said lugs to provide the resilient mounting of said shield to said blade.

3,937,646

EVAPORATION APPARATUS OF SPECIAL MATERIAL

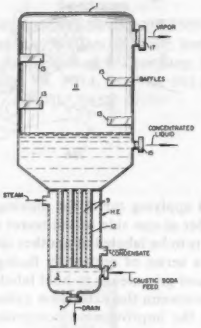
James E. Houston, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Nov. 29, 1973, Ser. No. 420,357

Int. Cl.[2] B01D *1/00, 1/06;* C22C *38/16*

U.S. Cl. 159—23 **6 Claims**

1. In an evaporation apparatus for use in the evaporation concentration, and/or purification of solutions containing alkali metal hydroxides and alkali metal chlorides, which apparatus has a liquid receiving chamber for the solutions being processed, a flowthrough heating zone containing heat transfer elements, a separation chamber for forming a liquid-vapor mixture of the solution being processed, passageways connecting said chambers and said zones, and baffle and distribution means positioned within said chambers, zones and/or passageways, the improvement which comprises forming at least a portion of those surfaces of the said chambers, zones and passageways, baffle and distribution means of said apparatus which are in contact with the solution of and/or vapors of the solution of said alkali metal hydroxide-alkali metal chloride containing solution at temperatures in excess of about 50°C of a ferritic stainless steel having the following composition:



Carbon	Up to 0.01% by weight
Manganese	Up to 0.40% by weight
Phosphorus	Up to 0.02% by weight
Sulfur	Up to 0.02% by weight
Silicon	Up to 0.40% by weight
Nitrogen	Up to 0.015% by weight
Copper	Up to 0.20% by weight
Nickel + copper	Up to 0.50% by weight
Chromium	25.0 to 27.5% by weight
Molybdenum	0.75 to 1.50% by weight
Iron	Balance

3,937,647

METHOD OF INCREASING CELLULOSIC PULP YIELDS IN AN ALKALINE DIGESTION PROCESS

Inga L. Backström, Stockholm; Nils J. C. Hartler, Lidingo, and Knut P. Kringstad, Vallingby, all of Sweden, assignors to Svenska Traforskningsinstitutet, Stockholm, Sweden

Filed Nov. 12, 1973, Ser. No. 415,153

Claims priority, application Sweden, Dec. 11, 1972, 16130/72

Int. Cl.[2] D21C *11/00*

U.S. Cl. 162—16 **6 Claims**

1. In a method of preparing pulp by alkaline digestion of cellulosic material, the improvement which comprises digesting said cellulosic material containing organic substances in an alkaline digestion liquid at a temperature of from 50°C to 200°C to give a pulp yield of not above 65 percent, lowering the pH of the digestion liquid to below 11 in the presence of the pulp to precipitate out at least 5 percent, based on said cellulosic material, of organic substances dissolved in the digestion liquid, and then continuing said digestion at a temperature of 50°C to 200°C until a large percentage of said precipitated organic substances have been absorbed by the pulp during an absorption period.

3,937,648

METHOD OF MAKING PAPER HAVING A HIGH RESIN FILL

Klaus Huebner, Ober-Ramstadt-Eiche; Helmut Neumann, Goddelau; Hans Ottofrickenstein, Darmstadt-Eberstadt; Helmut Moroff, Trautheim, and Norbert Suetterlin, Greisheim, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed June 15, 1973, Ser. No. 370,239

Claims priority, application Germany, June 24, 1972, 2230985

Int. Cl.[2] D21D *3/00*

U.S. Cl. 162—168 R 2 Claims

1. In the method of making a resin-filled paper on a paper machine from an aqueous fiber slurry having a resin filler dispersed therein, said resin-filled paper having a resin content of from 20 to 100 percent, based on the weight of the fibers therein, the improvement which comprises employing, as the aqueous resin-filled fiber slurry, a slurry comprising

A. 100 parts by weight of fibers comprising at least 30 percent by weight of natural cellulosic fibers;

B. an aqueous dispersion of a non-ionic synthetic thermoplastic resin free of groups capable of thermal cross-linking and completely comprising neutral vinyl or vinylidene monomers which form salts neither in aqueous alkaline media nor in aqueous acid media, said dispersion comprising from 0.5 to 2.5 percent, by weight of the aqueous phase of said dispersion, of a cationic dispersing agent, and from 1 to 4 percent, by weight of the aqueous phase of said dispersion, of a non-ionic dispersing agent, the dry weight of resin in said dispersion being from 30 to 100 parts; and

C. an amount of water such that the fiber content of the fiber slurry is between 0.5 and 1 percent.

3,937,649

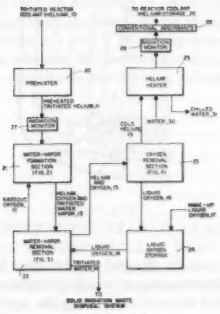
PROCESS AND SYSTEM FOR REMOVING TRITIUM

John N. Ridgely, 628 Rutledge Ave., Folsom, Pa. 19033

Filed Oct. 31, 1973, Ser. No. 411,249

Int. Cl.[2] G21C *17/00*

U.S. Cl. 176—19 R 14 Claims



1. A process for the removal of tritium from a system containing an inert-to-oxygen circulating fluid which becomes tritiated comprising the steps of: forming tritiated water vapor by combining with the tritiated circulating fluid gaseous oxygen under pressure and at a temperature sufficient to initiate and sustain a water vapor formation reaction between tritium in the circulating fluid and the gaseous oxygen; and then removing the tritiated water vapor from the circulating fluid-gaseous oxygen mixture, and the system, by fractional liquefaction.

3,937,650

NUCLEAR REACTOR PROTECTIVE SYSTEM

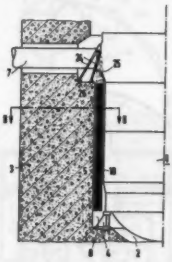
Axel Jungmann, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 26, 1973, Ser. No. 382,841

Claims priority, application Germany, Aug. 2, 1972, 2238024

Int. Cl. G21c *13/10*

U.S. Cl. 176—37 9 Claims



1. A nuclear reactor protective system including a reactor pressure vessel having a substantially cylindrical side wall protected by a biological shield forming a substantially cylindrical concrete wall surrounding said side wall and defining a circumferentially extending space therearound having a radial extent adequate to permit the insertion therein of a device for monitoring the condition of said side wall; wherein the improvement comprises a plurality of substantially cylindrical segments, and means for positioning said segments in said space so that the segments are circumferentially movable between mutually partial circumferential overlapping relationship forming a circumferentially continuous cylindrical wall and more complete circumferential overlapping relationship opening a portion of said space adequate for said insertion.

3,937,651

NUCLEAR REACTOR FACILITY

Hans-Peter Schabert, Erlangen, and Johann Ropers, Grossdechsendorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 254,736, May 18, 1972, abandoned. This application Mar. 4, 1974, Ser. No. 447,996

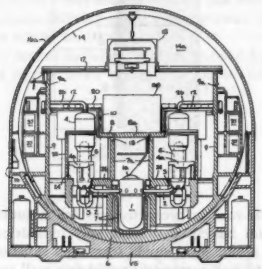
Claims priority, application Germany, May 21, 1971, 2125158

Int. Cl. G21c *9/00*

U.S. Cl. 176—38 6 Claims

1. A nuclear power facility comprising a pressurized-water reactor pressure vessel, at least one vertical steam generator horizontally offset from said vessel, a main pressurized-water coolant pipe loop interconnecting said pressure vessel and a lower portion of said steam generator, said loop containing circulating pressurized-water coolant, a concrete structure forming a steam generator and loop and extending upwardly and horizontally surrounding said steam generator and at least a substantial portion of said loop to a height above said steam generator and having an open top above said steam generator, said concrete structure forming at least one operating room separated from said steam generator room by one of said walls extending upwardly, accidental release of said coolant from said loop forming vapor having a vapor pressure, a horizontal ceiling above said steam generator and closing said top so that said release causes said steam generator room to be pressurized under said vapor pressure, and a containment shell enclosing said structure including said rooms and forming a space of substantial area above said steam generator room,

said ceiling being a metal ceiling formed by a metal grid-like construction defining a plurality of vertical openings and having horizontal sheet metal plates positioned on said construction and normally closing said openings, said plates being strong enough for personnel to walk upon but light enough in weight to be displaced upwardly to open said openings when the plates receive upward force from said vapor pressure in said steam generator room resulting from said loop accidentally permitting a release of said pressurized-water coolant, said opening when open being large enough in cross-sectional area collectively, to release said vapor pressure into said space to a degree substantially reducing said vapor pressure within said steam generator room and on said one of said walls ex-



tending upwardly and separating said equipment room from said steam generator room, and connecting means for connecting said plates to said metal grid-like construction and holding the plates against complete separation therefrom when forced upwardly by said fluid vapor pressure, said connecting means permitting said plates to swing upwardly when displaced to open said openings, said metal grid-like construction connecting with said open top of said concrete structure and being held thereby against horizontal displacement, and said generator having a top portion adjacently below said construction and means for connecting said top portion with said construction to restrain said top portion from horizontal displacement while permitting vertical movement of said top portion.

3,937,652

NUCLEAR POWER INSTALLATIONS

Brian Victor George, Willoughby Waterleys, England, assignor to British Nuclear Design & Construction Ltd., Leicester, England

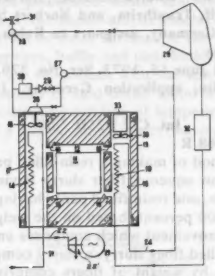
Filed Apr. 12, 1973, Ser. No. 350,629

Claims priority, application United Kingdom, Apr. 12, 1972, 16842/72

Int. Cl. G21c *15/00*

U.S. Cl. 176—60 **6 Claims**

1. A gas-cooled nuclear power installation comprising a nuclear reactor which includes a reactor core, at least one main boiler, at least one main coolant-gas circulator arranged to circulate coolant gas through the core and through the main boiler whereby to generate steam in the main boiler, a circulator-driving steam turbine arranged to drive said main coolant-gas circulator, and at least one main turbogenerator connected to be driven by steam generated in the main boiler, wherein the installation further comprises at least one auxiliary boiler, at least one auxiliary coolant-gas circulator arranged to circulate coolant gas through the core and the auxiliary boiler whereby to generate further steam in the auxiliary boiler and wherein the auxiliary boiler is connected



to supply said further steam to said circulator-driving steam turbine.

3,937,653

DIAGRID FOR SUPPORTING A NUCLEAR REACTOR CORE

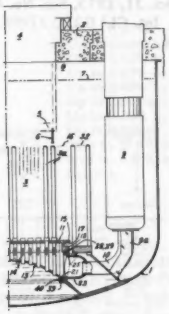
Jacques Leheu, Le Raincy, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 27, 1973, Ser. No. 345,473

Claims priority, application France, Apr. 19, 1972, 72.13789

Int. Cl.[2] G21C *15/20*

U.S. Cl. 176—61 **5 Claims**



1. A nuclear reactor diagrid combination for supporting the core of a nuclear reactor in which a liquid sodium coolant is circulated within a vessel containing the core and diagrid, said diagrid being constituted by a box structure having end-walls formed by two metallic plates braced by hollow cylindrical support columns which are suitably disposed at intervals within the box structure on a uniform pitch, the upper end plate being flat and horizontal and the axis of the reactor core being vertical, said diagrid being provided with means for applying the box structure against a support which forms part of the reactor vessel, wherein the lower end plate of said box structure has the shape of an upwardly convex spherical segment which terminates at its periphery in a flat rim and wherein the upper flat end plate has a circular flange which is parallel to the peripheral rim of the lower plate, said rim and

said flange being braced with respect to each other, the flange of the upper end plate resting on a ring-girder supported by the vessel which provides the box structure with a peripheral side restraint and the flat rim of the lower end plate being supported by a flat circular flange formed on a shell element rigidly fixed to the reactor vessel, wherein the shell element has a conical shape and is in the line of extension of the spherical segment of the lower end plate of the box structure, and wherein the ring-girder is a hollow metallic torus opening laterally toward the box structure, said torus being a manifold for supplying the diagrid with the coolant sodium.

3,937,654

PRODUCTION OF EDIBLE PROTEIN SUBSTANCES

Gerald L. Solomons, High Wycombe, and Gerald W. Scammell, Chinnor, both of England, assignors to Ranks Hovis McDougall Limited, London, England

Continuation of Ser. No. 459,021, April 8, 1974, abandoned, which is a continuation of Ser. No. 140,303, May 4, 1971, abandoned. This application July 25, 1975, Ser. No. 599,026

Claims priority, application United Kingdom, May 14, 1970, 23452/70; June 24, 1970, 30584/70

Int. Cl.² C12B *1/08;* C12D *13/06*

U.S. Cl. 195—35 **25 Claims**

1. A process for the production of an edible protein-containing substance which comprises incubating and proliferating, under aerobic conditions, a non-toxic strain of the genus Fusarium or a variant or mutant thereof in a culture medium containing all essential growth-promoting nutrient substances, of which carbon in the form of assimilable carbohydrate constitutes the limiting substrate in proliferation, and separating the proliferated organism comprising the edible protein-containing substance possessing a high net protein utilization value of at least 70 based on the α-amino nitrogen.

17. A method for the preparation of variants of *Fusarium graminearum* Schwabe IMI 145425 which comprises growing the parent strain IMI 145425 under continuous culture conditions with carbon limitation in a fermentation.

20. A method for cultivating a strain of *Fusarium graminearum* Schwabe IMI 145425 or a mutant or variant thereof wherein the strain is present in a culture medium containing or being supplied with all nutrients or additives necessary for the sustenance and multiplication of the strain, the medium having a pH between 3.5 and 7 at a temperature of between 25° and 34°C and wherein the carbon in the form of assimilable carbohydrate constitutes the limiting substrate in proliferation.

3,937,655

METHOD FOR PREPARING STABLE β-LACTAM-TYPE-NTIBIOTIC SUSCEPTIBILITY TEST DISCS

Ralph R. Pfeiffer, and Gary L. Engel, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 16, 1974, Ser. No. 461,465

Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 R **13 Claims**

1. A method for preparing stable β-lactam-type-antibiotic susceptibility test discs comprising contacting absorbent paper with a metered amount of a dispersion of a crystalline β-lactam-type-antibiotic in a volatile non-solvent vehicle, absorbing such vehicle into such paper, evaporating such vehicle from such paper leaving a deposit of a measured quantity of such antibiotic per unit area of such paper, and forming test discs from such paper, such discs having an area wherein the desired amount of β-lactam-type-antibiotic is uniformly and consistently deposited.

3,937,656

SHED-TYPE ENCLOSURE AT THE COKE SIDE OF COKE OVENS

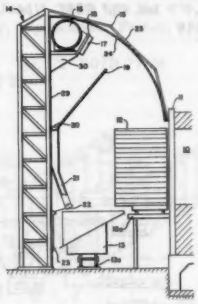
Erich Pries, and Friedrich-Wilhelm Drebes, both of Bochum, Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed May 31, 1974, Ser. No. 474,921

Claims priority, application Germany, June 1, 1973, 2327890

Int. Cl.² C10B *33/00;* C10G *41/08*

U.S. Cl. 202—262 **7 Claims**



1. In combination with a battery of coke ovens having a coke discharge side at which a track extends along said battery of coke ovens for the displacement of a quench car to receive coke pushed from a chamber forming said ovens, a shed at the coke discharge side of said ovens comprising: a wall extending along the entire length of said battery of coke ovens and spaced outwardly therefrom beyond said track, a roof rising from the top of said coke ovens, said roof extending above said track to said wall, extractor means for removing smoke from the area below said roof, a baffle plate extending from said wall in a direction upwardly and toward said battery of coke ovens within said shed, and a conveyor extending in a direction along the length of said battery of coke ovens, said conveyor lying between said baffle plate and said wall for receiving solid particles of coke falling onto the baffle plate within said shed.

3,937,657

ELECTROWINNING OF COPPER

Alan James Parker; Winfield Earle Waghorne, both of Canberra; Dion Ewing Giles; John Howard Sharp, both of Sydney; Robert Alexander, and David Michael Muir, both of Canberra, all of Australia, assignors to Anumin Pty. Limited, Canberra, Australia

Division of Ser. No. 237,061, March 22, 1972, Pat. No. 3,865,744. This application Dec. 17, 1974, Ser. No. 533,697

Claims priority, application Australia, Apr. 2, 1971, 4500/71; Apr. 2, 1971, 4501/71; Apr. 2, 1971, 4502/71; Apr. 28, 1971, 4735/71; June 4, 1971, 5110/71; Sept. 14, 1971, 6281/71; Sept. 24, 1971, 6411/71; Oct. 20, 1971, 6718/71; Oct. 20, 1971, 6798/71; Dec. 14, 1971, 7383/71; Jan. 26, 1972, 7776/72

Int. Cl.² C25C *1/12*

U.S. Cl. 204—108 **9 Claims**

2. The method as claimed in claim 1 in which the homogeneous solution being electrolysed is protected from gaseous oxidants, and contains at least 50% by volume water, sufficient sulfuric acid to maintain a pH of 3 or less, cuprous sulfate assaying at least 5 grams per liter cuprous ion and at least 2.5 moles of an organic nitrile selected from the group consisting of acetonitrile, 2-hydroxycyanoethane and mixtures thereof, per mole of cuprous ion in solution, and is circulated past the electrodes with a current density of between 4 and 30

amps per square foot and at a temperature of between 20° and 45°C.

3,937,658

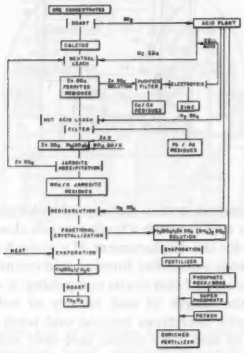
ELECTROLYTIC ZINC REFINING PROCESS INCLUDING PRODUCTION OF BY-PRODUCTS FROM JAROSITE RESIDUES

David A. Jackson, 330 W. Diversey Parkway, Chicago, Ill. 60657

Division of Ser. No. 377,623, July 9, 1973, Pat. No. 3,871,859. This application Dec. 24, 1974, Ser. No. 536,093

Int. Cl.[2] C25C *1/16*

U.S. Cl. 204—119 11 Claims



1. In a plant system for the electrolytic refining of zinc using the jarosite process, the process of treating the jarosite residue waste material to recover valuable by-products therefrom comprising acidifying the wet jarosite residue with sulphuric acid from the refining system acid plant only sufficiently to break down the basic sulphate and redissolve the iron sulphate to produce a solution containing dissolved plant nutrients including the sulphates of iron, ammonium, zinc, manganese and trace metals and thereafter withdrawing said solution from said plant system and treating said solution to recover the solute values thereof.

3,937,659

POLYCHLOROPRENE MIXTURE

Jurgen Boldt, Opladen, and Kurt Heine, Bad Honnef, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

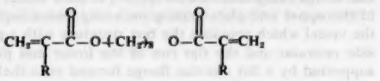
Filed Mar. 5, 1974, Ser. No. 448,188

Claims priority, application Germany, Mar. 9, 1973, 2311672

Int. Cl.[2] C08F *2/46*

U.S. Cl. 204—159.2 7 Claims

1. A chloroprene polymer composition consisting of (a) 90 to 20 parts by weight of a benzene soluble chloroprene polymer having a Mooney viscosity ML-4′ at 100°C. of from 30 to 100 and (b) 10 to 80 parts by weight of a benzene insoluble chloroprene polymer having a Mooney viscosity ML-4′ at 100°C. of from 30 to 75 and consisting of a copolymer of 90 to 99% by weight of chloroprene and 1 to 10% by weight of a copolymerizable monomer of the formula



wherein R is hydrogen or alkyl having 1 to 6 carbon atoms and *n* is an integer of from 2 to 6, said copolymer of (b) having been irradiated by γ-radiation or high speed electron radiation at a dose of 0.1 to 10.0 Mrad applied to a layer of (b) of 1 to 30 mm thickness in latex form and at a radiation intensity of 0.01 to 2,000 Mrad/h.

3,937,660

REGENERATION PROCEDURE FOR IRIDIUM-CONTAINING CATALYST

David J. C. Yates, Westfield, and Walter S. Kmak, Scotch Plains, both of N.J., assignors to Exxon Research & Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 343,304, March 21, 1973, which is a continuation-in-part of Ser. No. 248,683, April 28, 1972. This application Aug. 16, 1973, Ser. No. 388,744

Int. Cl.[2] C10G *35/08;* B01J *23/96*

U.S. Cl. 208—140 24 Claims

1. In a process for the catalytic reforming of hydrocarbons wherein a hydrocarbon feed stock is contacted with a catalyst comprising from about 0.01 to about 3.0 wt. % of an iridium component and a halogen component contained in an inorganic refractory oxide support at reforming conditions, the catalyst having been at least partially deactivated during contact with said feed stock by the depositing of carbonaceous residues, a method for regenerating said catalyst after discontinuing contact of said catalyst with said feed stock comprising:

1. contacting said catalyst in a reaction zone with a gaseous mixture containing oxygen at an elevated temperature of less than about 600°C. for a time sufficient to burn at least a substantial portion of said carbonaceous residues from said catalyst;
2. contacting said carbonaceous residue-depleted catalyst in said reaction zone with a hydrogen-containing gas at an elevated temperature for a time sufficient to convert a substantial portion of said iridium on said catalyst to its metallic form;
3. contacting said treated catalyst having a substantial portion of the iridium contained thereon in the metallic form in said reaction zone with an elemental halogen-containing gas at a temperature of at least about 300°C. for a time sufficient to redisperse at least a portion of the iridium on the catalyst;
4. contacting said halogen treated catalyst in said reaction zone with a hydrogen-containing gas at an elevated temperature for a time sufficient to convert a substantial portion of said iridium on said catalyst to its metallic form; and
5. contacting said treated catalyst having a substantial portion of the iridium contained thereon in the metallic form in said reaction zone with a halogen-containing gas at a

temperature of at least about 300°C. for a time sufficient to redisperse at least a portion of the iridium on the catalyst.

3,937,661

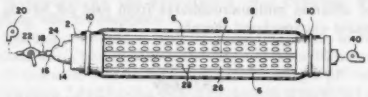
METHOD AND APPARATUS FOR FLUFFING, SEPARATING, AND CLEANING FIBERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Dan Padilla, Littleton, Colo.

Filed Mar. 12, 1974, Ser. No. 450,502

Int. Cl.² B07B 7/12

U.S. Cl. 209—250 **9 Claims**



1. Apparatus for fluffing, separating and cleaning fibers from fiber fragments and particulate matter comprising:

an elongated perforated tube, closed at one end and having means for directing a jet of air axially into the other end;

means for directing fibrous material into said air jet at said other end whereby said fibrous material is entrained by said jet and carried into said perforated tube; said fibrous material being directed into said air jet along a line which is not parallel to said air jet;

housing means spaced from but enclosing said perforated tube; and

means for withdrawing air from said housing means exteriorly of said tube whereby the fibers of said fibrous material are fluffed and separated from each other and from particulate matter as they enter said air jet, said fibers being retained in said tube and said particulate matter and fiber fragments being drawn outwardly of said perforated tube and housing by said last-named means.

3,937,662

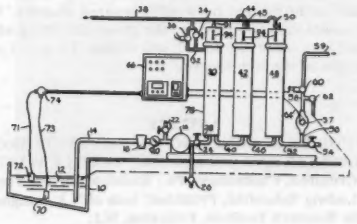
MARINE DISCHARGE CONTROL APPARATUS AND METHOD FOR TREATING FLUIDS ON A MARINE VESSEL

Ivan Bartik, Cookeville, Tenn., assignor to Keene Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,401

Int. Cl.² B01D 29/36

U.S. Cl. 210—23 **11 Claims**



1. In a system for treating bilge or ballast liquid on board a marine vessel to separate the oil therein from the water, said system comprising in combination, a filter/coalescing unit means having liquid inlet means, oil outlet means and water outlet means, said filter/coalescing unit means operable to separate and filter the oil and water flowing therethrough, a pump connected to supply liquid to be treated to said inlet means, said water outlet means including a turbidity meter operable to develop a signal in response to any oil that may be in the water, said turbidity meter operable to monitor the full flow of any water therein, and control means connected to said turbidity meter and responsive to said actuating signal for interrupting the flow of water through the water outlet means when oil of predetermined maximum is reached.

3,937,663

STRUCTURE OF FILTER MEMBERS

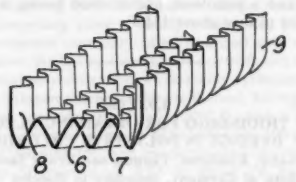
Pierre Etienne Bessiere, Golf Saint-nom-la-Breteche, France, assignor to Precision Mecanique Labinal, Saint-Ouen, France

Filed June 5, 1974, Ser. No. 476,458

Claims priority, application France, Apr. 16, 1974, 74.13138

Int. Cl.² B01D 27/06

U.S. Cl. 210—493 R **29 Claims**



1. A filter structure comprising a support and a porous folded sheet having a plurality of cooperating groups of corrugations, the folds of one group overlapping at least in part the folds of the adjacent group and having uniform thickness, length and substantially parallel fold apex lines, said folded sheet having at least two borders each having a single group of folds terminating in a frontal edge located in a plane substantially perpendicular to the apex lines of the folds, the folds of each of said borders extending outwardly of said cooperating groups of corrugations to form an extended area for contact with said support and seal means for embedding said border areas fixedly to said support.

3,937,664

OIL FILLED ELECTRICAL DEVICE

Fumio Tanimoto; Mineaki Nishimatsu, both of Kyoto; Sadayoshi Mukai, Katano, and Kaname Ishida, Kyoto, all of Japan, assignors to Nissin Electric Co., Ltd., Kyoto and Sugai Chemical Industry Co., Ltd., Wakayama, both of, Japan

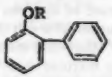
Filed Mar. 25, 1974, Ser. No. 454,132

Claims priority, application Japan, Mar. 29, 1973, 48-35921

Int. Cl.² H01B 3/18; H01F 27/02

U.S. Cl. 252—64 **10 Claims**

1. An oil-filled electrical device comprising a casing, an electrical device element in said casing and an insulating oil consisting essentially of one or more 2-diphenylalkylethers having the structural formula of



wherein R is the alkyl group expressed as C_nH_{2n+1} wherein $1 \leq n \leq 8$.

9. The device of claim **1**, wherein said insulating oil consists essentially of a mixture of at least two of said 2-diphenylalkylethers, one of which is more than 30% of the total amount of said oil.

10. The device of claim **1**, wherein said insulating oil consists essentially of a mixture of at least two of said 2-

diphenylalkylethers, one of which is from 30 to 70% of the total amount of said oil.

3,937,665

PHOTORECEPTOR SOLVENT CLEANER

Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 27, 1975, Ser. No. 553,783
Int. Cl.² C11D 7/50
U.S. Cl. 252—162 5 Claims

1. A method of cleaning photoreceptor surfaces comprising providing a filmed photoreceptor surface, applying a photoreceptor cleaning solution which comprises a solvent blend capable of dissolving toner polymers and paper tars, said blend comprising a halogenated hydrocarbon exhibiting no flash point, as determined by TAG Open Cup, ASTM Method D-1310 and a petroleum hydrocarbon having a closed cup flash point of over about 135°F.

3,937,666

USE OF THIOINDIGO FOR OBTAINING FLUORESCENT DYEINGS IN POLYVINYL CHLORIDE

Hugo Schafer, Kelkheim, Taunus, and Erwin Janousch, Camberg, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 181,193, Sept. 16, 1973, abandoned. This application July 25, 1973, Ser. No. 382,380
Claims priority, application Germany, Sept. 18, 1970, 2046111
Int. Cl.² C08F 45/66; C09K 11/00
U.S. Cl. 252—301.2 R 2 Claims

1. A fluorescent dyed polyvinyl chloride homopolymer composition consisting essentially of solid polyvinyl chloride homopolymer and an amount of unsubstituted thioindigo sufficient to effect fluorescence.

3,937,667

PROCESSES FOR SEPARATING METALS

Kenneth Thomas Bartlett Scott, Reading; John Herbert Grimes, and Peter William Ball, both of Basingstoke, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 4, 1970, Ser. No. 95,371
Claims priority, application United Kingdom, Dec. 15, 1969, 61087/69
Int. Cl.² B01J 13/00; C09K 3/00
U.S. Cl. 252—301.1 S 22 Claims

1. A process for separating a metal from a mixture including at least one further metal comprising:

forming a viscous mixture of a water-soluble polymeric organic compound with an aqueous medium containing said metals, said metal-containing medium being selected from the group consisting of a mixed solution of salts of said metals, a mixture of hydrous sols of said metals, and a mixture of a solution of a salt of one said metal with a hydrous sol of the other said metal;

forming said viscous mixture into discrete entities of selected physical configuration;

contacting said entities with chemical reagent means capable of precipitating at least one said metal as an insoluble compound whereby each entity is converted to a gel containing said compound;

said reagent means being also capable of dissolving at least one other said metal;

and physically separating said gelled entities from said reagent means.

3,937,668

METHOD FOR INCORPORATING SUBSTANCES INTO PROTEIN MICROSPHERES

Ilse Zolle, Lazarettgasse 14A, Vienna 1090, Austria

Continuation-in-part of Ser. No. 55,231, July 15, 1970, abandoned. This application Nov. 6, 1972, Ser. No. 304,218
Int. Cl. B01j 13/02; B44d 1/02
U.S. Cl. 252—316 1 Claim

1. A process for incorporating a substance capable of being precipitated into albumin millimicrospheres comprising: preparing a precipitate of said substance and forming a mixture of the precipitate with an aqueous solution of albumin; injecting said mixture into oil and pressing the resultant through a fine capillary or rotating disc to form an extremely fine emulsion of droplets of the precipitate and albumin in said oil, heating said oily mixture above 100°C and separating the formed albumin millimicrospheres from said oil having said precipitate encapsulated therein.

3,937,669

CATALYST FOR METHYLATION OF PHENOLS

Hitoshi Nakajima, Ageo; Fujio Nomura, and Shinichi Izawa, both of Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 207,546, Dec. 13, 1971, Pat. No. 3,855,318. This application June 10, 1974, Ser. No. 478,002
Claims priority, application Japan, Dec. 11, 1970, 45-109385; Dec. 17, 1970, 45-112490; Dec. 17, 1970, 45-112491
Int. Cl.² B01J 21/02, 23/84, 23/78
U.S. Cl. 252—432 5 Claims

1. A metallic oxide catalyst comprising an oxide or iron, an oxide of vanadium, and at least one oxide selected from the group consisting of oxides of manganese, magnesium, titanium, beryllium and boron in which the atomic ratio of iron to vanadium to other metal or mixture thereof is from about 9 to 1/9 : 1 : 1 – 0.01.

3,937,670

COMPOSITION FOR PREPARING SOLID ELECTROLYTES AND THE FORMULATION OF A SOLID ELECTROLYTE

Novella Vladimirovna Semkina, prospekt Bljukhera, 71/1, kv. 38; Zinaida Ulyanovna Evdokimova, pereulok Vstrechny, 7, korpus 1, kv. 7; Konstantin Sergeevich Assanovich, 4 ulitsa Cheljuskintsev, 18, kv. 84, all of Sverdlovsk, and Anatoly Alexandrovich Rozlovsky, ulitsa 3 Olovozavodskaya 3, kv. 10, Novosibirsk, all of U.S.S.R.

Filed Oct. 2, 1973, Ser. No. 402,814
Int. Cl.² H01B 1/08
U.S. Cl. 252—519 2 Claims

1. A composition for preparing solid electrolytes, consisting essentially of in percent by weight, sintered alumina, 93 to 99.5; a substance selected from the group consisting of zinc oxide and iron oxide, 0.5 to 5.0; and titania, 0.5 to 2.0 of the total weight of the composition.

3,937,671

METHOD OF RECOVERING CONSTITUENTS FROM POLYESTER AND CELLULOSIC TEXTILE WASTE

Irving Gruntfest, Cheltenham, Pa.; Rudolph Turner, Trenton, and Ludwig Rebenfeld, Princeton, both of N.J., assignors to Textile Research Institute, Princeton, N.J.

Filed Nov. 18, 1974, Ser. No. 524,590
Int. Cl.² C08J 11/04
U.S. Cl. 260—2.3 6 Claims

1. A method of producing useful products from textile wastes containing blended polyester and cellulose fibers which comprises treating such wastes with an aqueous solution of glacial acetic acid and acetic anhydride under conditions which serve to acetylate the cellulose while leaving the polyester substantially unaffected and separating the unreacted

polyester fiber from the cellulose acetate composition thereby produced.

3,937,672

PROCESS FOR THE MANUFACTURE OF CONSOLIDATED SHAPED STRUCTURES OF CELLULOSE HYDRATE

Walter Busch, Wiesbaden-Biebrich; Klaus-Dieter Hammer, Mainz, and Wolfgang Klendauer, Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Sept. 20, 1973, Ser. No. 399,086

Claims priority, application Germany, Sept. 23, 1972, 2246829

Int. Cl.² G08L *1/06*; D01F *11/02*

U.S. Cl. 260—17.3 **22 Claims**

1. A process for the preparation of a cellulose hydrate moulding which comprises

a. treating a cellulose hydrate moulding while in the gel state, for a period within the range of from 10 seconds to 20 minutes, with an aqueous liquid having a pH value of less than 7 and having dissolved therein at least one plasticizer, a chemical cross-linking agent comprising at least one cyclic urea compound having at least 2 N-methylol groups and being present in an amount of 0.5 to 15% relative to the weight of the plasticizer solution, and at least one cross-linking catalyst selected from the group consisting of an acid and an acid salt,

b. drying the moulding to a residual water content of from 8 to 12% by weight, and

c. heating the moulding at a temperature within the range of from 100° to 150° C for a period of from 30 seconds to 20 minutes.

20. A cellulose hydrate moulding prepared by a process as claimed in claim 1.

3,937,673

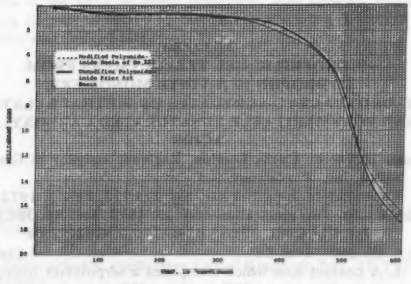
MODIFIED AMIDE-IMIDE RESINS AND METHOD OF MAKING THE SAME

Ernest C. Koerner, and Donny R. Disque, both of Fort Wayne, Ind., assignors to Phelps Dodge Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 399,393, Sept. 21, 1973. This application June 3, 1974, Ser. No. 475,826. The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.

Int. Cl.² C08G *18/38*

U.S. Cl. 260—18 TN **22 Claims**



1. A composition of matter comprising the reaction product of aromatic tricarboxylic acid anhydride reactant and aromatic diisocyanate reactant and aliphatic dicarboxylic acid reactant having more than 6 carbon atoms reacted in a reaction solution comprising aprotic solvent having solvency parameters within the following ranges: δd 8.0 through 10.0, δp 0.3 through 4.5, δh 0.7 through 4.0 and said reactants at a temperature ranging from about 150°C. to about 200°C., said reactants being a major portion of said reaction solution, said dicarboxylic acid reactant being present in an amount which is greater than about 10 mol percent and less than about 50 mol percent of said anhydride reactant.

3,937,674

PREPARATION OF MODIFIED PETROLEUM RESINS

Jan Laarkamp, Midden-Beemster, Netherlands, assignor to Stamicarbon N.V., Geleen, Netherlands

Filed Sept. 19, 1972, Ser. No. 290,359

Claims priority, application Netherlands, Sept. 24, 1971, 7113141

Int. Cl.² C08L *91/00*

U.S. Cl. 260—19 UA **28 Claims**

1. In a process for the preparation of a modified petroleum resin comprising mixing and reacting together, at a temperature of about 150° C. to about 320° C:

a. a weakly unsaturated petroleum resin, and

b. from about 5 to about 50% by weight, calculated on the amount of resin component (a), at least one unsaturated fatty acid having from 12–30 carbon atoms, the improvement comprising using a weakly unsaturated petroleum resin composed essentially of polymerized units of cyclopentadiene, methyl cyclopentadiene or both and obtained by thermal polymerization of essentailly cyclopentadiene, methylcyclopentadiene or dimers thereof, having a melting point between 70° C. and 200° C. and a bromine number, expressed as grams of bromine per 100 grams of resin, of less than 150, and conducting the reacting in the presence of from about 0.05 to about 5% by weight, calculated on the amount of resin component (a), of metal compound soluble in the reaction mixture and substantially free from forming strongly colored products in combination with components (a) and (b), the metal selected from the group consisting of magnesium, aluminum and zinc, and continuing the reaction until a resin product having a melting point of at least 125° C. is obtained.

3,937,675

TREATMENT OF TEXTILE WASTE FORMED OF POLYESTER AND CELLULOSIC FIBERS

Irving Gruntfest, Cheltenham, Pa., and Rudolph Turner, Trenton, N.J., assignors to Textile Research Institute, Princeton, N.J.

Filed Nov. 18, 1974, Ser. No. 524,591

Int. Cl.² C08J *11/04*

U.S. Cl. 260—2.3 **8 Claims**

1. A method for recovering polyester fibers and cellulosic material in useful form from textile wastes containing the same which comprises the steps of treating the waste with an aqueous solution of a mineral acid under reaction conditions which serve to convert the cellulose to a substantially non-fibrous condition while leaving the polyester fibers substantially unaffected, separating the liquid and cellulosic reaction product from the polyester fibers and thereafter separating said reaction product from said liquid.

3,937,676

LUBRICITY COATING FOR PLASTIC COATED GLASS ARTICLES

Francis J. Shonebarger, Lancaster, and William Brown, Amanda, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Division of Ser. No. 375,684, July 2, 1973, Pat. No. 3,864,151. This application Oct. 7, 1974, Ser. No. 512,401

Int. Cl.² C08L *91/00*

U.S. Cl. 260—23 R **10 Claims**

1. A lubricity coating material in water emulsion form and having a solids content consisting essentially of,

1 part by weight of a member of the group of salts consisting of calcium stearate, zinc stearate, calcium oleate, zinc oleate, and mixtures thereof,

about 0.5 to 2 parts of a soluble polyvinyl alcohol,
and about 1.7–3.6 parts of an oleate of the class consisting of potassium, sodium, and ammonium oleates, and mixtures thereof.

3,937,677

PROCESS FOR THE MANUFACTURE OF HEAT-CURABLE SYNTHETIC RESINS WHICH CAN BE DILUTED WITH WATER AND ARE SUITABLE FOR THE ELECTROPHORETIC COATING PROCESS

Bernhard Broecker, Hamburg; Richard Schardt, Oststeinbeck, and Gerhard Werner, Glashutten, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 11, 1974, Ser. No. 449,618

Claims priority, application Switzerland, Mar. 13, 1973, 3619/73

Int. Cl.[2] B25B *13/28*

U.S. Cl. 260—23.7 A **20 Claims**

1. Process for the manufacture of heat-curable synthetic resins, based on reaction products of maleic anhydride with mixtures of polybutadiene, unsaturated hydrocarbon resins and unsaturated fatty acid glyceride esters, which can be diluted with water and are suitable for the electrophoretic coating process, characterized in that a mixture consisting of

a. 20–60% by weight of a polybutadiene having an average molecular weight of 750–2,000 and an iodine number between 300 and 450,

b. 10–60% by weight of a hydrocarbon resin of predominantly aliphatic structure, having a viscosity between 30 and 800 cP, measured in 70% strength solution in toluene at 20°C. and an iodine number of between 160 and 400, consisting of

b_1. 20–80% by weight of polyisoprene,

b_2. 5–50% by weight of cyclopentadiene and/or dicyclopentadiene, and

b_3. 5–50% by weight of further mono-unsaturated or poly-unsaturated hydrocarbons with 5–6 C atoms which are of predominantly aliphatic or cycloaliphatic structure, and

c. 5-40% by weight of a fatty acid glyceride ester, wherein each fatty acid radical contains 16–18 C atoms and the fatty acid glyceride ester has an iodine number between 140 and 220,

is pre-polymerized by heating to 200°–270°C. until the reaction mixture of components (a), (b) and (c), which has an initial viscosity of about 100 to 300 sec., measured according to DIN 53,211, displays viscosities between 500 and 2,000 sec., measured according to DIN 53,211, the resulting mixture is then reacted with

d. 10–20% by weight of maleic anhydride at 180° to 190°C., until no further free maleic anhydride is present, the sum of components (a), (b), (c) and (d) employed having to add up to 100 % by weight, and

e. in the resulting adduct the anhydride groups present are opened by hydrolysis with water or alcoholysis with the amount of monohydric alcohols with 1–4 C atoms required to form the half-ester.

3,937,678

PROCESS FOR MODIFYING RHEOLOGICAL AND SUSPENSION PROPERTIES OF NONAQUEOUS SUSPENSION

Zenpachi Yasuda, Kasukabe; Hiroshi Koizumi, Tokyo; Masao Hasunuma, Ohmiya, and Satoshi Oda, Koshigaya, all of Japan, assignors to Kusumoto Chemicals Ltd., Tokyo, Japan

Filed July 5, 1974, Ser. No. 485,948

Claims priority, application Japan, July 16, 1973, 48-79290

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—28.5 R **10 Claims**

1. A process for improving the rheological and suspension properties of a nonaqueous fluid system which contains finely divided solid particles characterized in that: (I) an amide wax having a melting point of about 100° to about 160°C. obtained from reaction of hydrogenated castor oil fatty acid or an organic acid mixture containing at least 30 molar percent of hydrogenated castor oil fatty acid with at least one primary or secondary amine; and (II) an emulsifiable polyethylene wax having an acid number of about 2 to 50, a softening point of about 95 to about 120°C., a density of about 0.92 to about 0.98 and a penetration of about 1 to about 20; are added to the nonaqueous fluid system.

3,937,679

ELECTRODEPOSITABLE COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. Nos. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, and Ser. No. 100,825, Dec. 22, 1970, and Ser. No. 100,834, Dec. 22, 1970, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and Ser. No. 100,825, and Ser. No. 100,834, said Ser. No. 100,825, and Ser. No. 100,834, each is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of said Ser. No. 772,366, said Ser. No. 129,267, is a continuation-in-part of said Ser. No. 100,825. This application Aug. 4, 1972, Ser. No. 277,931

Int. Cl.[2] C08L *61/06, 61/20*

U.S. Cl. 260—29.3 **21 Claims**

1. A coating composition electrodepositable on a cathode comprising an aqueous dispersion comprising

a. an acid salt solubilized quaternary onium salt group containing synthetic organic resin where the onium group is selected from the group consisting of ammonium, sulfonium and phosphonium,

b. an amine/aldehyde condensate and

c. an unsaturated methylol phenol ether the combined weight of (b) and (c) being from about 2% to about 30% by weight of the combined weight of (a), (b) and (c), and the weight ratio of (b) to (c) being between about 5:1 and about 1:5.

3,937,680

HYDROPHILIC GEL TERPOLYMERS FROM HYDROPHILIC N-VINYL MONOMERS, HYDROXYALKYL ACRYLATES OR METHACRYLATES AND POLYMERIZABLE UNSATURATED CARBOXYLIC ACIDS

John Trevor de Carle, London, England, assignor to Global Vision, Inc., Parsippany, N.J.

Continuation-in-part of Ser. No. 223,122, Feb. 3, 1972, abandoned. This application May 29, 1973, Ser. No. 364,532

Int. Cl.[2] C08L *39/06;* **B29D** *11/00;* **G02C** *7/04*

U.S. Cl. 260—29.6 TA **4 Claims**

1. A contact lens which comprises a terpolymer hydrogel containing from about 55% to about 85% by weight of water based on the total weight of the hydrogel, the molecular structure of said terpolymer including alkaline carboxylate moieties therein and being the hydrated polymeric product resulting from the polymerization of a monomer mixture comprising 30–50% by weight of N-vinyl lactam, up to 3% by weight of a glycol dimethacrylate or diacrylate, 0.25–5.6% by weight acrylic or methacrylic acid and a hydroxyalkyl acrylate or methacrylate monomer which constitutes the balance of the mixture.

3,937,681

TIRE TREAD OF HOMOPOLYMERS OF BUTADIENE

Karl-Heinz Nordsiek, Marl, Germany, assignor to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

Continuation of Ser. Nos. 435,869, Jan. 23, 1974, and Ser. No. 304,598, Nov. 8, 1972, abandoned, and Ser. No. 8,745, Feb. 4, 1970, abandoned. This application Dec. 20, 1974, Ser. No. 535,107

Claims priority, application Germany, Feb. 7, 1969, 1906037

Int. Cl.[2] B29H 5/02; B60C 5/00; C08K 5/01

U.S. Cl. 260—33.6 AQ 10 Claims

1. A vulcanizable composition shaped into tire tread strip form, consisting essentially of

a. 100 parts by weight of a polybutadiene consisting of 25–50% monomer units arranged in the 1,2-position; 10–40% monomer units arranged in the 1,4-cis position; and correspondingly 15–55% monomer units arranged in the 1,4-trans position, the ratio of cis to trans structures being 10:55 to 40:15, said polybutadiene having an ML-4 100° C. value of 70–120 and being prepared by subjecting a lithium polymerized polybutadiene having an ML-4 100° C. value of 10–60 to a molecular weight jump or coupling reaction to increase the molecular weight thereof;

b. 5–100 parts by weight of a plasticizer oil; and

c. 30–120 parts by weight of a carbon black filler.

3,937,682

STRESS-SENSITIVE COMPOSITION

Mitsuo Onozuka; Koki Nomoto, and Koji Sato, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 436,593, Jan. 24, 1974, abandoned. This application Oct. 30, 1974, Ser. No. 519,276

Claims priority, application Japan, Oct. 5, 1971, 46-78125

Int. Cl.[2] C08K 3/30; C01B 17/00

U.S. Cl. 260—42.24 2 Claims

1. A polyolefine formed product made of a composition comprising a polyolefine resin and 50–90 wt.% of hemihydrated calcium sulfite, prepared by reacting alkali bisulfite or ammonium bisulfite with calcium carbonate, having crystal sizes of 1 – 30 μ in the lateral or smaller dimension and 5 – 100μ in the axial or larger dimension, said formed product being capable of becoming soft and pliable when subjected to severe mechanical forces.

3,937,683

COHESIVE COATING COMPOSITIONS

Andrew Nicholas Ferrar, Bridgwater, England, assignor to British Cellophane Limited, England

Filed Nov. 19, 1973, Ser. No. 417,406

Claims priority, application United Kingdom, Nov. 23, 1972, 54237/72

Int. Cl.[2] C08J 3/20; C08K 3/34

U.S. Cl. 260—42.47 1 Claim

1. A cohesive coating composition comprising in dispersion in a liquid a mixture of between 70 and 90% by weight of carboxylated styrene butadiene rubber and between 10 and 30% by weight of poly-n-butyl methacrylate in which dispersion there is incorporated between 10% and 25% by weight, based on the weight of the solids, of particulate hydrated aluminum silicate having a mean particle size lying in the range between 2.0 and 20 microns.

3,937,684

PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT DIORGANOPOLYSILOXANES FOR USE IN HEAT VULCANIZABLE SILICONE RUBBER COMPOSITIONS

John S. Razzano, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Apr. 24, 1974, Ser. No. 463,435

Int. Cl.[2] C08G 77/04

U.S. Cl. 260—46.5 G 7 Claims

1. A process for producing diorganopolysiloxane polymers having a viscosity from 1,000 to 200,000,000 centipoise at 25°C where at least one of the organo groups is an aliphatic or haloaliphatic radical of 3 carbon atoms or more consisting essentially of (a) hydrolyzing in a water and a water-immiscible organic solvent mixture, a silane of the formula,

$$R\,R'\,SiX_2$$

and mixtures of said silane, where R is selected from the class consisting of methyl, ethyl, vinyl and phenyl and R' is selected from the class consisting of alkyl radicals, halogenated alkyl radicals and cycloalkyl radicals of 3 to 8 carbon atoms, X is halogen; (b) separating the water and water-immiscible organic solvent from the hydrolyzate; (c) adding 0.5 to 2% by weight of a catalyst selected from the class consisting of KOH, NaOH, and CsOH to the hydrolyzate and heating the hydrolyzate to 150°C to 200°C; (d) removing overhead a mixture of cyclic polysiloxanes and transferring such cyclic polysiloxanes into a distillation column; (e) separating by distillation at a temperature of 80°–200°C and 1 to 50 mm of Hg vacuum essentially pure tetracyclic polysiloxanes of the formula,

$$(R\,R'\,SiO)_4$$

and mixtures thereof, where R and R' are as previously defined; (f) heating the tetracyclic polysiloxanes above 100°C with a nitrogen purge to reduce the water content to less than 10 parts per million; (g) reacting the cyclic tetrapolysiloxanes at a temperature in the range of 0° to 90°C in the presence of 5 to 300 parts per million of a catalyst selected from the class consisting of CsOH and

where R^2 is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, cycloalkyl radicals of 4 to 8 carbon atoms and phenyl, B is selected from the class consisting of nitrogen and phosphorous, R^3 is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms, cycloalkyl radicals of 4 to 8 carbon atoms, phenyl, siloxane chains of the unit formula, $R_n^4\,SiO_{(4-n)/2}$ and mixtures thereof, where R^4 is selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, a varies from 1.5 to 2.5; until equilibration is reached and (h) neutralizing the catalyst in the reaction mixture after equilibrium has been reached.

3,937,685

POLYGLYCIDYL ETHERS

Herbert Kölbel; Georg Manecke, and Eftichia Güttler-Pimenidou, all of Berlin, Germany, assignors to Hoechst Aktiengesellschaft, Germany

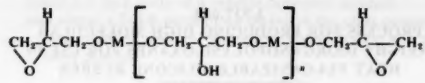
Filed Nov. 19, 1973, Ser. No. 417,120

Claims priority, application Germany, Nov. 21, 1972, 2256947

Int. Cl.[2] C08G 30/04

U.S. Cl. 260—47 EP 14 Claims

1. A polyglycidyl ether of the formula



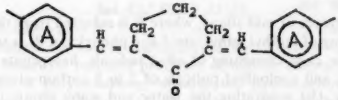
(I)

in which

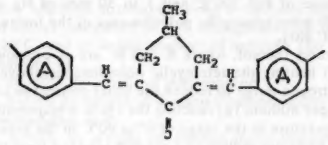
n denotes zero or an integer of 1 to about 20, and

M denotes a chalcone radical of the formula

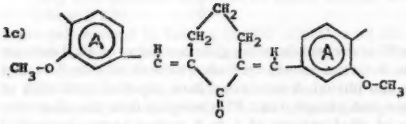
1a)



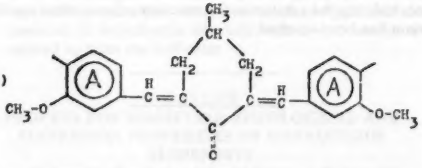
1b)



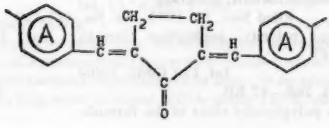
1c)



1d)



1e)



3,937,686

PROCESS OF PREPARING HIGH MOLECULAR WEIGHT POLYAMIDE WITH RECOVERY OF DIAMINE AND RETURN OF SAME TO POLYMERIZATION SYSTEM

Valdis Ansis Augstkalns, Parkersburg, W. Va., assignor to c/o E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jan. 10, 1974, Ser. No. 432,172

Int. Cl.² C08G *69/28*

U.S. Cl. 260—78 R **7 Claims**

1. In the process for preparing a fiber-forming or moldable polyamide from an aqueous solution of a polyamide-forming salt of an organic diamine and an organic dicarboxylic acid wherein the salt is concentrated and polymerized, during which steam and organic diamine are vented from the evaporation and polymerization equipment; the improvement which comprises in sequence

1. collection and condensing vented vapor to form an aqueous solution of organic diamine condensate,
2. contacting the condensate of the vented vapor with the hydrogen form of a carboxylic cation-exchange resin which has a strength sufficient to recover said organic diamine from an aqueous solution thereof,
3. contacting the resin employed in step (2) with an organic dicarboxylic acid of the type employed in making said polyamide to form an aqueous solution of organic diamine-organic dicarboxylic acid salt,
4. collecting the aqueous solution obtained in step (3), and
5. adding the solution from step (4) to the salt preparation facility of said polymerization equipment.

3,937,687

AMIDIFICATION PRODUCTS OF C_{19} DICARBOXYLIC ACID AND CYCLICAL DIAMINES

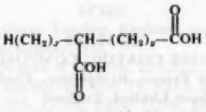
Edgar R. Rogier, Hopkins; Allan H. Jevne, Anoka, and Gerald L. Schwebke, Minneapolis, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed May 28, 1974, Ser. No. 473,968

Int. Cl.² C08G *69/26*

U.S. Cl. 260—78 R **2 Claims**

1. A polyamide consisting essentially of the amidification product of a mixture of isomers of heptadecane dicarboxylic acid having the formula:



wherein *x* is an integer from 1 to 15, *y* is an integer from 1 to 15 and the sum of *x* and *y* is 16, and a cyclical diamine bis(4-aminocyclohexyl)methane, wherein the equivalents of the dicarboxylic acid and the diamine are substantially equal, wherein the amidification reaction is conducted at a temperature between about 100°C. and 300°C., and wherein the amidification product has a logarithmic viscosity number of about 30 to 150 as measured in orthochlorophenol solvent at a concentration of 0.005 g./ml. at a temperature of 30°C.

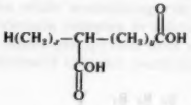
3,937,688

COPOLYAMIDES FROM AN ISOMERIC MIXTURE OF HEPTADECANE DICARBOXYLIC ACID

Edgar R. Rogier, Hopkins; Allan H. Jevne, Anoka, and Gerald L. Schwebke, Minneapolis, all of Minn., assignors to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed May 28, 1974, Ser. No. 473,967
Int. Cl.² C08G 69/26
U.S. Cl. 260—78 R 6 Claims

1. A noncrystalline, moisture insensitive polyamide consisting essentially of an amidification product of an acid component of (a) a mixture of isomers of heptadecane dicarboxylic acid having the formula



wherein x is an integer from 1 to 15, y is an integer from 1 to 15 and the sum of x and y is 16, and (b) an acid which is isophthalic acid, terephthalic acid, alkyl substituted isophthalic acid wherein the alkyl radical has from 1 to 12 carbon atoms or mixtures thereof; wherein the equivalent percentage of the heptadecane dicarboxylic acid in the acid component is from about 15 to 80% and of the acid which is isophthalic acid, terephthalic acid, alkyl substituted isophthalic acid or mixtures thereof is from about 85 to 20% based on the total acid component; and a diamine component which is hexamethylene diamine, or trimethylhexamethylene diamine, wherein the equivalents of the acid component and the diamine component are substantially equal, wherein the amidification reaction is conducted at a temperature between about 100°C. and 300°C., and wherein the amidification product has a logarithmic viscosity number of about 30 to 150 as measured in orthochlorophenol solvent at a concentration of 0.005 g./ml. by weight and at a temperature of 30°C.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

3,937,689

RADICAL INITIATOR-CURABLE DIALLYL ESTER COMPOSITIONS AND CURED RESINS OBTAINED THEREFROM

Yuji Mitani; Yuzo Aito; Masahiro Yamaguchi, all of Hino, and Kiyoshi Nawata, Hachioji, all of Japan, assignors to Teijin Ltd., Osaka, Japan

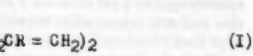
Filed July 1, 1974, Ser. No. 484,871
Int. Cl.² C08F 218/16, 218/18, 222/26
U.S. Cl. 260—78.5 UA 3 Claims

1. A radical initiator-curable diallyl ester composition consisting essentially of 80 – 100% by weight of the following components (A) and (B):

A. a prepolymer wherein

1. 70 – 100 mole % of its structural units are derived from a diallyl ester selected from the group consisting of

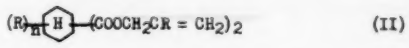
a. a diallyl ester of benzenedicarboxylic acid having the formula (I)



(I)

wherein the R's, which may be the same or different, are independently selected from the group consisting of hydrogen and methyl, and n is an integer from 1 to 2,

b. a diallyl ester of cyclohexanedicarboxylic acid having the formula (II)



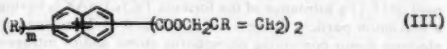
(II)

wherein the R's and n are as above defined, and

c. a mixture of the above (a) and (b); and

2. 30 – 0 mole % of its structural units are derived from other compounds selected from monomeric diallyl esters of dibasic acids and other monomers and polymers, said compound being copolymerizable with said (a) – (c) under the conditions of forming said prepolymer; and

B. a monomer of a diallyl ester of naphthalenedicarboxylic acid having the formula (III)



(III)

wherein the R's are as above defined, and m is an integer from 1 to 4, which groups $-COOCH_2CR{=}CH_2$ are attached in a position selected from the 2,7-, 1,5- and 2,6-positions;

said monomer (B) being contained in an amount of 5 – 50% by weight based on said prepolymer (A), and the remaining 20 – 0% by weight of said composition being a compound (C) other than said (A) and (B), said (C) being selected from the group consisting of monomers and polymers copolymerizable with a member selected from the group consisting of said prepolymer (A) and said monomer (B) at the conditions under which said composition is cured.

3,937,690

PROCESS FOR THE PREPARATION OF THERMOPLASTICALLY WORKABLE FLUORO-OLEFIN POLYMERS

Gregor Weisgerber, Konigswinter, and Werner Trautvetter, Troisdorf-Spich, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 7, 1973, Ser. No. 367,902
Claims priority, application Germany, June 19, 1972, 2229607
Int. Cl.² C08F 214/18, 218/08, 114/20, 114/22
U.S. Cl. 260—86.3 9 Claims

1. In a process for the preparation of thermoplastically workable fluoro-polyolefins and their copolymers by polymerization of fluorine-containing olefins in the aqueous phase in the presence of water-soluble radical-forming catalysts and a

polymerization regulator, the improvement which comprises employing as such regulator a partially or completely halogenated hydrocarbon having from two to three carbon atoms and at least three halogen atoms of which at least one is fluorine and at least another is bromine or iodine said regulator being employed in an amount between 0.05 and 10% by weight.

3,937,691

MANUFACTURE OF POLY (α-OLEFINS)

Gerhard Staiger, Bobenheim-Roxheim; Klaus Bronstert, Carlsberg; Hannes Schick, Mannheim; Peter Hennenberger, and Heinz Mueller-Tamm, both of Ludwigshafen, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 30, 1973, Ser. No. 365,218

Claims priority, application Germany, May 30, 1972, 2226167

Int. Cl.² C08F *4/66, 10/06*

U.S. Cl. 260—93.7 **5 Claims**

1. In a process for the manufacture of poly(α-olefins) by polymerization of α-olefins at temperatures of from 0° to 150°C and pressures of from 1 to 100 atm. absolute using a catalyst system comprising (1) a titanium-containing component of (1.1) a substance of the formula $TiCl_3.1/3AlCl_3$ having a maximum particle diameter of 2 mm and (1.2) an organic electron donor containing phosphorus atoms and/or nitrogen atoms and ground together with said substance of formula $TiCl_3.1/3AlCl_3$ (1.1) to form a complex compound therewith, and (2) an aluminum-containing component of a substance of a formula $Al(C_nH_{2\cdot n+1})_3$ or $Al(C_nH_{2\cdot n+1})_2Cl$ or a mixture thereof, where *n* is an integer of from 2 to 6, provided that the molar ratio of titanium in the substance of formula $TiCl_3.1/3AlCl_3$ (1.1) to the electron donor (1.2) is from 10:5 to 10:1 and the molar ratio of titanium in the substance of formula $TiCl_3.1/3AlCl_3$ (1.1) to the aluminum-containing component (2) is from 10:5 to 10:300, the improvement consisting essentially of using as said catalyst system a system in which grinding of the substance of formula $TiCl_3.1/3AlCl_3$ (1.1) with the electron donor (1.2) has been carried out without the use of auxiliaries or additives in a vibratory ball mill using steel balls having a diameter of from 6 to 60 mm and at a grinding acceleration of from 30 to 70 $m.sec^{-2}$ over a period of time of from 10 to 70 hours at a temperature which is from 4° to 10°C below the temperature at which the particles in the ground material begin to agglomerate.

3,937,692

PROCESS FOR THE STEREOSPECIFIC POLYMERIZATION OF DIOLEFINS, PRODUCTS OBTAINED THEREBY AND PROCESS FOR THE POLYMERIZATION OF OLEFINS

Gabriele Lugli; Alessandro Mazzei, and Gabriele Modini, all of San Donato Milanese, Italy, assignors to Snamprogetti S.p.A., San Donato Milanese, Italy

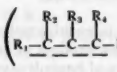
Filed Nov. 17, 1972, Ser. No. 307,373

Claims priority, application Italy, Nov. 26, 1971, 31730/71; Oct. 10, 1972, 30289/72

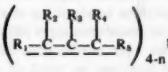
Int. Cl.² C08F *4/82, 4/44, 136/04*

U.S. Cl. 260—94.3 **20 Claims**

1. Process for the stereospecific homopolymerization of a diolefin wherein the homopolymerization reaction is carried out in the presence of a catalyst selected from the uranium allyl derivatives having the formula



and



wherein R_1, R_2, R_3, R_4 and R_5, the same or different, are selected from the group consisting of hydrogen atoms, alkyl radicals containing from 1 to 10 carbon atoms, aryl radicals containing from 6 to 10 carbon atoms, cycloalkyl radicals containing from 4 to 10 carbon atoms and alkylaryl radicals; X is an anion selected from Cl^-, Br^- and I^-; *n* is a number ranging between 1 and 3; and the dotted line indicates the possible delocalization of the valence electrons.

3,937,693

PRODUCTION OF EDIBLE PROTEIN CONTAINING SUBSTANCES

Peter John Towersey, High Wycombe; John Longton, Chesham, and Geoffrey Norman Cockram, Henley on Thames, all of England, assignors to Ranks Hovis McDougall Limited, London, England

Filed Feb. 8, 1974, Ser. No. 440,775

Claims priority, application United Kingdom, Feb. 13, 1973, 7087/73

Int. Cl.² A23J *3/00*

U.S. Cl. 260—112 R **12 Claims**

1. A process for reducing the nucleic acid content in the production of an edible protein-containing substance comprising contacting a grown non-toxic microfungus of the class Fungi Imperfecti with a solvent comprising between 40% and 100% by volume of a lower alkanol containing up to three carbon atoms and the remainder being water, substantially separating said solvent from said microfungus, incubating said microfungus at a pH between 5 and 9.5 in an aqueous suspension and at a temperature between 30°C and 80°C for a time of at least 90 seconds and thereafter separating said microfungus from the aqueous suspension.

3,937,694

PROCESS FOR THE RECOVERY OF ZINC BACITRACIN FREE FROM ZINC HYDROXIDE

Judit Báthory; Márta Éry née Nagy; Lajos Gerei; Ferenc Lakatos; Mágdolna Stiller née Kisteleki, and Tamás Vághy, all of Budapest, Hungary, assignors to Phylaxia Oltoanyag- es Tapszertermelo Vallalat, Budapest, Hungary

Filed Apr. 12, 1974, Ser. No. 460,574

Claims priority, application Hungary, Apr. 16, 1973, PI 380

Int. Cl.[2] C07C *103/52;* C07G *7/00;* C08H *1/00*

U.S. Cl. 260—112.5 R 3 Claims

1. A process for the recovery of bacitracin from a solution containing same which comprises the step of raising the pH of said solution in the presence of zinc ion from a soluble zinc source added to the solution and in the presence of ammonium ion to precipitate the bacitracin in the form of a zinc bacitracin complex while maintaining zinc which does not form said zinc bacitracin complex in solution; removing the zinc bacitracin complex precipitated from said solution; and drying the zinc bacitracin complex precipitate.

3,937,695

P-GLU-TRP-SER-TYR-D-LYS-LEU-ARG-PRO-GLY-NH_2 AND INTERMEDIATES

Dmitrios Sarantakis, West Chester, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Nov. 4, 1974, Ser. No. 520,515

Int. Cl.[2] C07C *103/52;* A61K *37/00*

U.S. Cl. 260—112.5 LH 5 Claims

1. A compound selected from the class consisting of

L-p-Glu-L-Trp-L-Ser-L-Tyr-D-Lys-L-Leu-L-Arg-L-Pro-Gly-NH_2 (I)

and

R^4-L-p-Glu-L-Trp(R^6)-L-Ser(R^3)-L-Tyr(R^2)-D-Lys(R^5)-L-Leu-L-Arg(N^G-R^1)-Pro-Gly-X (II)

and its non-toxic salts; wherein

R^1 is a protecting group for the N^5, N^{ω} and $N^{\omega'}$ nitrogen atoms of arginine selected from the group consisting of nitro, tosyl, benzyloxycarbonyl, adamantyloxycarbonyl and tert-butyloxycarbonyl or R^1 is hydrogen;

R^2 is a protecting group for the phenolic hydroxyl group of tyrosine selected from the group consisting of tert-butyl, tetrahydropyranyl, trityl, benzyl, 2,6-dichlorobenzyl, 4-bromobenzyloxycarbonyl and benzyloxycarbonyl or R^2 is hydrogen;

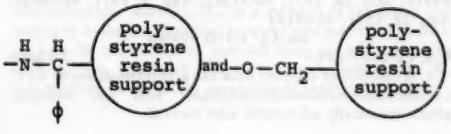
R^3 is a protecting group for the alcoholic hydroxyl group of serine and is selected from the group consisting of acetyl, benzoyl, tetrahydropyranyl, tert-butyl, trityl, 2,6-dichlorobenzyl and benzyl or R^3 is hydrogen;

R^4 is selected from the group consisting of hydrogen or an α-amino protecting group;

R^5 is a protecting group for the side chain amino substituent of lysine selected from the class consisting of 2-chlorobenzyloxycarbonyl, benzyloxycarbonyl, tosyl, t-amyloxycarbonyl, t-butyloxycarbonyl; or R^5 is hydrogen;

R^6 is selected from the class consisting of hydrogen and formyl; and

X is selected from the group consisting of NH_2, O-(lower)-alkyl, O-benzyl and an anchoring bond linked to a solid polystyrene resin represented by one of the formula



wherein said polystyrene resin is cross linked through the phenyl group on each second carbon atom of the alkyl chain of said polystyrene and said symbol ϕ means phenyl, with the proviso that at least one of R^1, R^2, R^3, R^5 and R^6 is a protecting group.

3,937,696

PROCESS FOR PREPARING HIGHER PURITY AZO COMPOUNDS

Richard N. Knowles, and Earl P. Moore, Jr., Hockessin, both of Del., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 2, 1974, Ser. No. 457,386

Int. Cl.[2] C07C *107/02*

U.S. Cl. 260—192 9 Claims

1. In a process for producing an azonitrile by coupling an aminonitrile in the presence of a hypochlorite, the improvement which comprises acidifying the reaction mixture to a pH of a maximum of 4 and adding an alkali metal nitrite, alkali metal sulfite, alkali metal bisulfite, alkali metal thiosulfate, alkaline earth metal nitrite, alkaline earth metal sulfite, alkaline earth metal bisulfite, alkaline earth metal thiosulfate, quaternary ammonium nitrite, quaternary ammonium sulfite, quaternary ammonium bisulfite, quaternary ammonium thiosulfate, sulfur dioxide, nitrogen oxide, oxalic acid, formaldehyde or hydroxylamine as a reducing agent after the coupling reaction is completed.

3,937,697

12-DEHYDRO DIGOXIN-4‴-AND 3‴-ALKYL ETHERS

Ulrich Stache, Hofheim, Taunus; Werner Fritsch, Neuenhain, Taunus; Werner Haede, Hofheim, Taunus, and Ernest Lindner, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

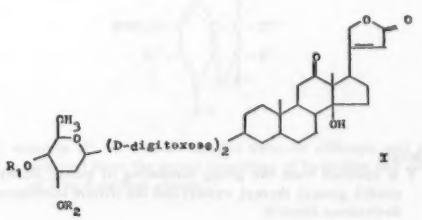
Filed Feb. 28, 1975, Ser. No. 554,182

Claims priority, application Germany, Mar. 2, 1974, 2410012

Int. Cl.[2] C07J *19/00*

U.S. Cl. 260—210.5 4 Claims

1. A compound of the formula I



in which R_1 and R_2 are different and each stands for hydrogen or lower alkyl of 1 to 4 carbon atoms.

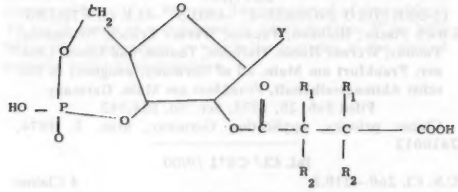
3,937,698

TRITIATED DERIVATIVES OF CYCLIC NUCLEOTIDES MONOPHOSPHATES

Sidney Gutcho, Monsey; Raul Rapun, Sloatsburg, both of N.Y.; Herman Rutner, Hackensack, N.J., and Andrew Charig, Valley Cottage, N.Y., assignors to Becton, Dickinson & Company, Rutherford, N.J.

Filed July 27, 1973, Ser. No. 383,461
Int. Cl. C07d *51/52*, *51/54*
U.S. Cl. 260—211.5 R 27 Claims

1. A compound selected from the group consisting of compounds represented by the following structural formula I:



I

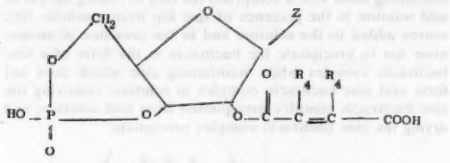
wherein

Y is selected from the group consisting of inosyl, adenyl, uradyl, guanyl, thymyl, cytidyl and the tritium substituted derivatives thereof;

each R_1 is selected from the group consisting of hydrogen, tritium and lower alkyl; and

each R_2 is selected from the group consisting of tritium and hydrogen with at least one R_2 being tritium;

and compounds having the following structural formula II:



II

wherein

Z is selected from the group consisting of uradyl, guanyl, inosyl, thymyl, adenyl, cytidyl and the chloro-, bromo and iodo- substituted derivatives thereof; and

each R_4 is selected from the group consisting of hydrogen, chloro, iodo, bromo, and lower alkyl.

3,937,699

6-(1'-CYCLOHEXENYLGLYCINAMIDO)PENICILLANIC ACID AND SALTS THEREOF

Tsunehiko Asako, Kyoto; Takenobu Soma, Suita; Hirotomo Masuya, Kobe; Tadatsugu Harukawa, Kyoto, and Takuichi Miki, Amagasaki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 188,622, Oct. 12, 1971, Pat. No. 3,824,237. This application May 7, 1974, Ser. No. 467,823
Claims priority, application Japan, Oct. 12, 1970, 45-89918; May 24, 1971, 46-35382; Aug. 3, 1971, 46-58905; Aug. 28, 1971, 46-66104
Int. Cl.[2] C07D *499/46*
U.S. Cl. 260—239.1 2 Claims

1. A compound selected from the group consisting of 6-(1'-cyclohexenylglycinamido)penicillanic acid and non-toxic pharmaceutically acceptable salts thereof.

3,937,700

NOVEL 1,2-METHYLENE-17α-ACYLOXY (OR IMPROVED HYDROXY)-9β, 10α-STEROID COMPOUNDS OF THE PREGNANE SERIES, PHARMACEUTIC PREPARATIONS ON THE BASIS OF THE NOVEL COMPOUNDS AND METHODS OF PRODUCING SAID COMPOUNDS AND PREPARATIONS

Harmen Van Kamp; Pieter Westerhof, and Lucas Morsink, all of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

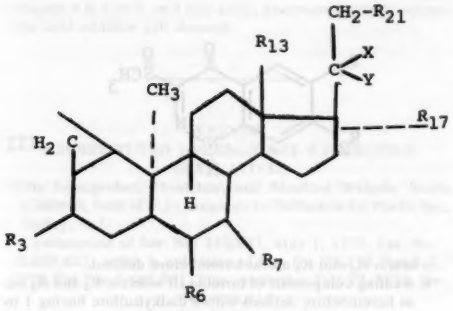
Continuation of Ser. No. 120,705, March 3, 1971, abandoned. This application July 18, 1973, Ser. No. 380,196

Claims priority, application Netherlands, Mar. 4, 1970, 7003064

Int. Cl.² C07J *17/00*

U.S. Cl. 260—239.55 R 14 Claims

1. A compound of the formula



wherein X is hydrogen and Y is a member selected from the group consisting of hydroxy and esterified hydroxy of 1–20 carbon atoms derived from an acid containing only carbon, hydrogen and carboxylic moieties or X and Y together form a double bonded oxygen atom, R_3 is a member selected from the group consisting of 3-keto-4-dehydro, 3-keto-4,6-bisdehydro-, 3-OR′-3,5-bisdehydro and 3-OR′-4,6-bisdehydro wherein OR′ is a member selected from the group consisting of esterified hydroxy of 1–20 carbon atoms derived from an acid containing only carbon, hydrogen and carboxylic moieties, methoxy, ethoxy, butoxy, cyclohexyloxy, benzyloxy, tetrahydrofuranyloxy and tetrahydropyranyloxy, R_6 is a member selected from the group consisting of hydrogen, chlorine, fluorine, 6,6-difluoro, 6,6-dichloro and methyl, R_7 is a member selected from the group consisting of hydrogen and 6,7-methylene with the proviso that R_7 is 6,7 methylene when R_6 is hydrogen and R_6 is a member of the group consisting of hydrogen, chlorine and fluorine abd R_3 is 3-keto-4-dehydro when R_7 is 6,7-methylene, R_{17} is a member of the group consisting of esterified hydroxy of 1 to 5 carbon atoms and esterified hydroxy of 1 to 8 carbon atoms derived from an acid containing only carbon, hydrogen and carboxylic moieties, R_{21} is a member of the group consisting of hydrogen, fluorine, hydroxy and esterified hydroxy of 1 to 20 carbon atoms derived from an acid containing only carbon, hydrogen and carboxylic moieties, and R_{13} is a member of the group consisting of methyl and ethyl.

3,937,701

1-(10-CYANO/HALO-5H-DIBENZO[A,D]CYCLOHEPTEN--YL)-4-[(PYRIDYLMETHYLENE)AMINO]PIPERAZINES

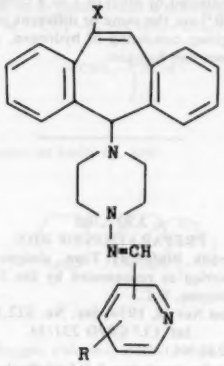
John W. Cusic, Skokie, and Charles R. Ellefson, Chicago, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 1, 1974, Ser. No. 519,939

Int. Cl.² C07D *401/12*

U.S. Cl. 260—240 G 12 Claims

1. A compound of the formula



wherein X represents chlorine, bromine or cyano and R represents hydrogen or lower alkyl.

3,937,702

2,3-DIHYDRO-2-AMINOBENZOFURAN-5-YL SULFONATES

Peter Stuart Gates, Cambridge; John Gillon, Great Shelford, and David Thomas Saggers, Saffron Walden, all of England, assignors to Fisons Limited, Suffolk, England

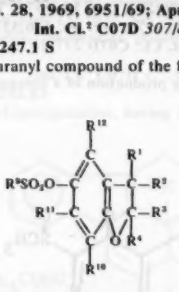
Continuation of Ser. No. 826,274, May 20, 1969, Pat. No. 3,689,507. This application Aug. 9, 1972, Ser. No. 279,262

Claims priority, application United Kingdom, May 24, 1968, 24858/68; Feb. 28, 1969, 6951/69; Apr. 8, 1969, 17985/69

Int. Cl.² C07D *307/82*

U.S. Cl. 260—247.1 S 13 Claims

1. A benzofuranyl compound of the formula



wherein R^1, R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen and alkyl of 1 to 6 carbon atoms.

R^4 is $-NR^6R^7$ wherein R^6 and R^7 are the same or different members selected from the group consisting of alkyl of 1–4 carbon atoms and halogen substituted alkyl of 1 to 4 carbon atoms, or R^6 and R^7 together with the nitrogen to which they are attached form a heterocyclic ring selected from the group consisting of piperidino, morpholino, methyl piperazino and pyrrolidino,

R^9 is a member selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by halogen, alkyl or 1 to 4 carbon atoms substituted by alkoxy of 1 to 6 carbon atoms, phenyl and phenyl substituted by alkyl of 1 to 4 carbon atoms, and

R^{10}, R^{11} and R^{12} are the same or different and are selected from the group consisting of hydrogen, alkyl of 1 to 4 carbon atoms and halogen.

3,937,703

PREPARATION OF RDX

Joseph A. Meredith, Bluff City, Tenn., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 8, 1974, Ser. No. 522,153
Int. Cl.² C07D *251/54*
U.S. Cl. 260—248 NS **5 Claims**

1. A process for preparing 1,3,5-trinitrohexahydro-s-triazine, which comprises reacting formaldehyde with a nitrile of the general formula RCN, wherein R is an alkyl group of 1 to 3 carbon atoms, in the absence of added solvents to produce the corresponding 1,3,5-triacylhexahydro-s-triazine, and contacting the resulting reaction mixture containing said triazine with concentrated nitric acid at a temperature sufficient to effect nitrolysis of said triazine to form 1,3,5-trinitrohexahydro-s-triazine.

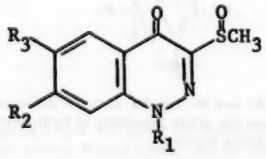
3,937,704

3-(METHYLSULFINYL)CINNOLINONES AND THEIR DERIVATIVES

Maximilian von Strandtmann, Rockaway; John Shavel, Jr., Mendham; Sylvester Klutchko, Hackettstown, and Marvin Cohen, New Milford, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 190,293, Oct. 18, 1971. This application Nov. 15, 1973, Ser. No. 416,332
Int. Cl.² C07D *237/28*
U.S. Cl. 260—250 C **1 Claim**

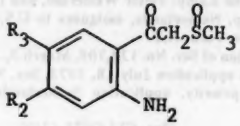
1. A process for the production of a compound of formula I:



I

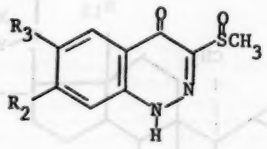
wherein R_1 is methyl, and R_2 and R_3 are hydrogen, chlorine, methyl and methoxy, comprising the steps of:

a. treating compounds of formula II:



II

with sodium nitrite and hydrochloric acid to give a compound of formula III:



III

wherein R_2 and R_3 are as hereinbefore defined;

b. treating compounds of formula III wherein R_2 and R_3 are as hereinbefore defined with a dialkylsulfate having 1 to 6 carbon atoms in the alkyl residue and an alkali metal hydroxide; and

c. recovering the products of formula I wherein R_1, R_2 and R_3 are as hereinbefore defined.

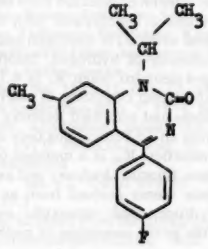
3,937,705

1-ISOPROPYL-7-METHYL-4-(P-FLUOROPHENYL)-2(1H)-QUINAZOLINONE

Goetz E. Hardtmann, Florham Park, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 233,289, March 9, 1972, abandoned. This application July 3, 1974, Ser. No. 485,360
Int. Cl.² C07D *239/82*
U.S. Cl. 260—251 QB **1 Claim**

1. The compound of the formula:



3,937,706

1-(2'ETHYNYL-PHENOXY)-2-HYDROXY-3-(CYCLOALKYL-AMINO)-PROPANES AND SALTS THEREOF

Herbert Koppe; Werner Kummer; Helmut Stahle; Karl Zeile, all of Ingelheim am Rhein; Albrecht Engelhardt, Mainz, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

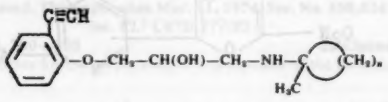
Continuation-in-part of Ser. No. 57,353, July 22, 1970, Pat. No. 3,755,413. This application Nov. 29, 1972, Ser. No. 310,638

Claims priority, application Germany, July 23, 1969, 1937477

Int. Cl.[2] C07C *93/06*; C07D *473/00*

U.S. Cl. 260—254 3 Claims

1. A compound of the formula



wherein *n* is 4 or 5, or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,937,707

6-SUBSTITUTED 1-PHENAZINOL 5,10-DIOXIDE DERIVATIVES

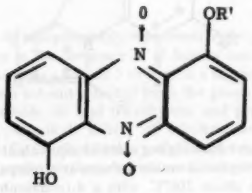
Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 248,907, May 1, 1972, Pat. No. 3,829,423, which is a division of Ser. No. 25,298, April 2, 1970, Pat. No. 3,681,331. This application July 22, 1974, Ser. No. 490,615

Int. Cl.[2] C07D *241/46*

U.S. Cl. 260—267 3 Claims

1. A compound of the formula



wherein R' is selected from the group consisting of halo-lower alkyl, and phthalimido-N-lower alkyl.

3,937,708

N-PHENYL-IMIDAZOLIDINE-1-ONES

Anton Mentrup; Ernst-Otto Renth; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

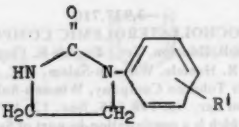
Continuation of Ser. No. 259,532, June 5, 1972, abandoned. This application Feb. 8, 1974, Ser. No. 440,823

Claims priority, application Austria, June 7, 1971, 4920/71

Int. Cl.[2] C07D *295/12*

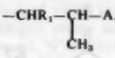
U.S. Cl. 260—268 PH 5 Claims

1. A compound of the formula



wherein

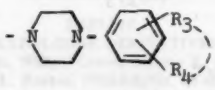
R' is in the m- or p- position and is selected from the group consisting of $-CH_2-A$, $-CHR_1-CH_2-A$ and



where

R_1 is hydrogen or hydroxyl, and

A is



where

R_3 is hydrogen, chlorine, methyl, ethyl, trifluoromethyl or lower alkoxy, and

R_4 is hydrogen or methyl, or

R_3 and R_4, together with each other and neighboring carbon atoms of the phenyl ring to which they are attached, are naphthyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

3,937,709

VINCAMINE DERIVATIVES AND PROCESS FOR THE PREPARATION OF VINCAMINE AND DERIVATIVES THEREOF

Thierry Sevenet, Gif, Yvette; Claude Thal, Malakoff; Henri Philippe Husson, Chevreuse, and Pierre Potier, Bois-Darcy, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

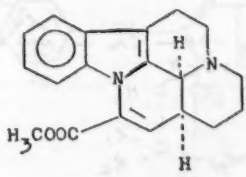
Filed June 15, 1973, Ser. No. 370,334

Claims priority, application France, June 19, 1972, 72.22021

Int. Cl.[2] C07D *471/04*

U.S. Cl. 260—293.53 7 Claims

1. 20-Deethyl-apovincamine, having the formula:



under its racemic and optically active forms.

3,937,710
HYPOCHOLESTEROLEMIC COMPOUNDS

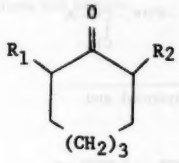
Bobby R. Ezzell, Houston, Tex.; Eugene R. Fluck, Berwyn, Pa., and Louis R. Haefele, Winston-Salem, N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Division of Ser. No. 198,445, Nov. 12, 1971, Pat. No. 3,781,444, which is a continuation-in-part of Ser. No. 105,076, Jan. 8, 1971, abandoned. This application Aug. 15, 1973, Ser. No. 388,366

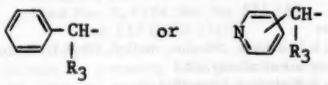
Int. Cl.[2] G07C *49/34*; C07D *213/50*

U.S. Cl. 260—297 R 4 Claims

1. As new compositions of matter compounds of the formula



where R_1 and R_2 =



with R_3 being H, OH, OCH_3, OC_2H_5, CH_3 or C_2H_5 and the aromatic ring in each of R_1 and R_2 being independently unsubstituted or substituted with not more than three substituents selected from Cl, F, CN, NH_2, CF_3, OH, lower alkyl, lower alkoxy, lower alkylamine and lower dialkylamino.

3,937,711
4-(CARBOXAMIDOETHYL) PIPERIDINES

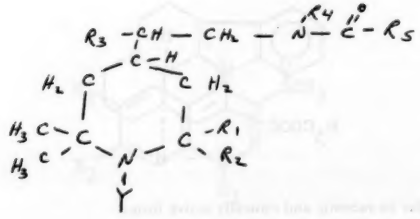
Barry Cook, Flixton, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 15, 1973, Ser. No. 406,527

Int. Cl.[2] C07D *211/32*

U.S. Cl. 260—293.86 8 Claims

1. A compound of the formula



3,937,712
(5-NITRO-2-FURYL)-PYRIDINES

Ludwig Schroder, Ingelheim am Rhine; Klaus Thomas, Gau-Algesheim, and Hanns Goeth, Biberach and der Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

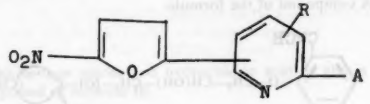
Continuation-in-part of Ser. No. 290,334, Sept. 19, 1972, Pat. No. 3,518,256. This application May 28, 1974, Ser. No. 473,324

Claims priority, application Germany, Sept. 22, 1971, 2147288

Int. Cl.[2] C07D *213/44*

U.S. Cl. 260—296 AE 6 Claims

1. A compound of the formula



wherein

A is alkoxy of 1 to 10 carbon atoms, dimethylamino-ethoxy or diethylamino-ethoxy, and

R is hydrogen, alkyl of 1 to 4 carbon atoms, or pyridyl.

3,937,713
PROCESS FOR THE PREPARATION OF S-TRIAZOLO[3,4-B]BENZOTHIAZOLES

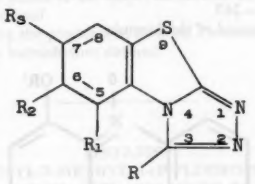
Charles J. Paget, Indianapolis, and James H. Wikel, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 7, 1974, Ser. No. 449,141

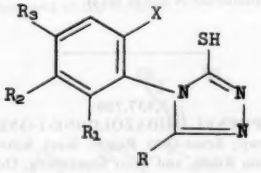
Int. Cl.[2] C07D *513/04*

U.S. Cl. 260—305 8 Claims

1. A process for preparing an s-triazolo(3,4-b)benzothiazole compound of the formula:



which comprises commingling a molar equivalent of base in a substantially anhydrous amide solvent at a temperature from about 60°C. to about 200°C. with a 4-(o-halophenyl)-1,2,4-triazole-3-thiol compound of the formula:



and recovering the product; wherein, in the foregoing formulas,

R is hydrogen, C_1–C_{11} alkyl, cyclopropyl or trifluoromethyl;

R_1 is hydrogen, bromo, chloro or fluoro;

R_2 and R_3 are independently hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, bromo, chloro, fluoro or trifluoromethyl with the limitation that at least one of R_2 and R_3 is hydrogen;

X is bromo, chloro or fluoro;
subject to the further limitation that when R_1 is halogen, R is other than hydrogen and R_2 is hydrogen.

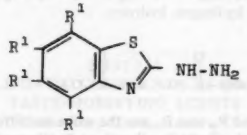
3,937,714

EXCHANGE AMINATION PROCESS FOR PREPARING 2-HYDRAZINOBENZOTHIAZOLES

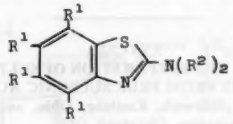
Charles J. Barnett, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 296,381, Oct. 10, 1972, abandoned. This application Mar. 11, 1974, Ser. No. 450,024
Int. Cl.[2] C07D *277/82*
U.S. Cl. 260—305 26 Claims

1. Process for the preparation of a compound of the formula



wherein each R^1 independently represents hydrogen, halo, lower alkyl of C_1-C_3, lower alkoxy of C_1-C_3, or lower alkylthio of C_1-C_3, subject to the limitation that at least two R^1's represent hydrogen; which process comprises reacting a corresponding 2-aminobenzothiazole compound of the formula



wherein each R^2 independently represents hydrogen or methyl with hydrazine in the presence of at least a catalytic amount of an acid exhibiting a pK_a of 5 or less, at a temperature above 100°C., and in a solvent selected from the group consisting of C_2-C_4-alkylenediols; di- and tri(ethylene and propylene) glycols; mono(C_1-C_4-alkyl) ethers of ethylene and propylene gylcols; mono(C_1-C_4-alkyl) ethers of di- and tri(ethylene and propylene) glycols; triethanolamine; sulfolane; and dimethylsulfoxide.

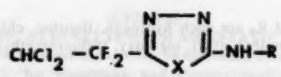
3,937,715

CERTAIN DIFLUORODICHLOROETHYLDIAZOLE COMPOUNDS

Hans Röchling, Altenhain, Taunus; Peter Hartz, Eschborn, Taunus, and Gerhard Horlein, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 20, 1974, Ser. No. 481,459
Claims priority, application Germany, June 23, 1973, 2332000
Int. Cl.[2] C07D *285/12, 271/10*
U.S. Cl. 260—306.8 D 2 Claims

1. Compounds of the formula



where X is oxygen or sulfur and R hydrogen, (C_1–C_4)-alkyl, C_1–C_8-alkanoyl, (C_1–C_3)-halo -alkyl-carbonyl, (C_5–C_6)-alkoxy-alkyl-carbonyl, (C_1–C_4)-alkoxycarbonyl, phenyloxycarbonyl, N-mono- or di-(C_1–C_4)-alkyl-carbamoyl, N-(C_1–C_4)-alkyl-N-(C_1–C_4)-alkoxy-carbamoyl, N-phenyl-carbamoyl, the phenyl nucleus of which optionally being substituted by one or two halogen atoms and/or trifluoromethyl groups; morpholino-carbonyl, N′-methylpiperazino-carbonyl, piperidino-carbonyl, pyrrolidino-carbonyl, N-(trihalogenophenoxy-sulfonyl)carbamoyl or N-(1,1,3,3-tetrachloro-2-propoxy-sulfonyl)carbamoyl, or, in the case of R being H or alkyl, also the physiologically tolerable salts thereof.

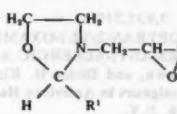
3,937,716

OXAZOLIDINE DERIVATIVES

Sheldon N. Lewis, Willow Grove; Jerome F. Levy, Dresher, and Napoleon L. Horton, Philadelphia, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed July 9, 1973, Ser. No. 377,377
Int. Cl.[2] C07D *263/04*
U.S. Cl. 260—307 FA 4 Claims

1. An N-glycidyl-1,3-oxazolidine of the formula



wherein R^1 is hydrogen or a hydrocarbyl radical selected from the group consisting of alkyl groups having 1 to 4 carbon atoms, and aralkyl groups selected from benzyl, phenethyl, and menaphthyl.

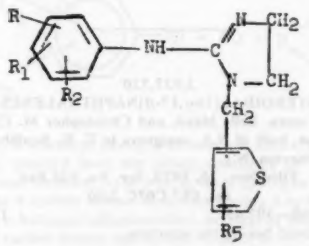
3,937,717

2-PHENYLAMINO-IMIDAZOLINES-(2)

Helmut Stahle; Herbert Koppe; Werner Kummer, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Filed Feb. 11, 1974, Ser. No. 441,451
Claims priority, application Germany, Feb. 23, 1973, 2308883
Int. Cl.[2] C07D *49/34*
U.S. Cl. 260—309.6 5 Claims

1. A compound of the formula



wherein

R, R_1 and R_3 are each hydrogen, fluorine, chlorine, bromine, methyl, ethyl, methoxy, trifluoromethyl or cyano, and

R_8 is hydrogen, methyl or ethyl, or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

3,937,718

PROCESS FOR THE PREPARATION OF A CARBOXYLIC ACID ESTER

Teruaki Mukaiyama; Masaaki Ueki; Rei Matsueda, and Hiroshi Maruyama, all of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Filed Nov. 17, 1970, Ser. No. 90,420

Claims priority, application Japan, Nov. 19, 1969, 44-92684

Int. Cl.[2] C07D *207/46*

U.S. Cl. 260—326.4 5 Claims

1. A process for the preparation of a carboxylic acid ester which comprises reacting an aliphatic, aromatic or heterocyclic carboxylic acid with an aliphatic, aromatic or heterocyclic alcohol or an alkyl- or aryl-sulfenic acid ester thereof in the presence of an aliphatic or aromatic hydrocarbonyl tertiary phosphine and a disulfide of a mercaptoheterocyclic compound containing a nitrogen-carbon double bond with which the disulfide linkage is conjugated.

3,937,719

(4-OXO-4H-1-BENZOPYRAN-2-YL)-OXAMIC ACID, SALTS AND ESTERS ANTI-ALLERGIC AGENTS

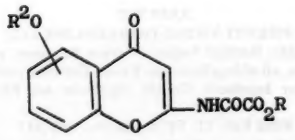
John H. Sellstedt, Pottstown, and Dieter H. Klaubert, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,672

Int. Cl.[2] C07D *311/02*

U.S. Cl. 260—345.2 5 Claims

1. A compound of the formula



in which

R is —H, alkyl of 1 to 6 carbon atoms or an alkali metal cation and

R^2 is alkyl of 1 to 6 carbon atoms or hydroxyalkyl of 2 to 6 carbon atoms.

3,937,720

STEROIDAL[16α,17-β]NAPHTHALENES

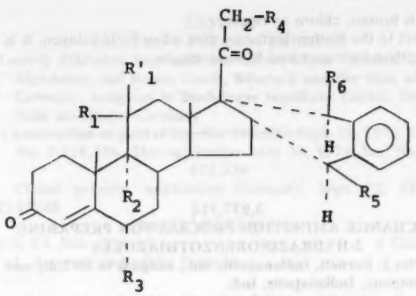
Ravi K. Varma, Belle Mead, and Christopher M. Cimarusti, Hamilton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 25, 1974, Ser. No. 526,866

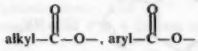
Int. Cl.[2] C07C *3/00*

U.S. Cl. 260—397.45 17 Claims

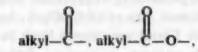
1. A steroid having the structure



and the 1,2-dehydro derivative thereof, wherein R_1 is chlorine, fluorine or hydroxy and R′, is hydrogen or R_1 and R′, together are =O; R_2 is hydrogen or halogen; R_3 is hydrogen, methyl or fluorine; R_4 is hydrogen, hydroxy,



or halogen; and R_5 and R_6 are the same or different and are hydrogen, alkyl, alkylthio, alkoxy, carboalkoxy, formyl,



hydroxy, halogen, phenyl or cyano, with the proviso that when R_5 and R_6 are different, one of R_5 and R_6 is hydrogen.

3,937,721

METHOD FOR THE PREPARATION OF SULFONIC ACID ESTERS FROM FREE SULFONIC ACIDS

Calvin William Schroeck, Eastlake, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

Division of Ser. No. 358,213, May 7, 1973. This application May 9, 1974, Ser. No. 468,359

Int. Cl.[2] C07C *143/16*

U.S. Cl. 260—456 A 4 Claims

1. A method for the preparation of a sulfonic acid ester which comprises reacting an acrylamidoalkanesulfonic acid with a compound having the formula

wherein

R^1 is a lower alkyl radical; and

y is 1, 2 or 3.

3,937,722

α-(CYANOETHYL)-BENZOIN ETHERS

Hans-Georg Heine, Krefeld; Hans Rudolph, Krefeld-Bockum, and Karl Fuhr, Krefeld, all of Germany, assignors to Bayer AG, Germany

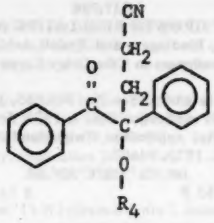
Division of Ser. No. 163,470, July 16, 1971, which is a continuation-in-part of Ser. No. 885,985, Dec. 17, 1969, abandoned. This application Nov. 15, 1973, Ser. No. 416,041

Claims priority, application Germany, Jan. 19, 1969, 1902051

Int. Cl.[2] C07C *121/75*

U.S. Cl. 260—465 F 3 Claims

1. A compound of the formula



wherein R_4 is ethyl or isopropyl.

3,937,723

CYCLOALIPHATIC COMPOUNDS AS ODOUR- AND TASTE-MODIFYING AGENTS

Karl-Heinrich Schulte-Elte, Onex, Geneva, Switzerland, assignor to Firmenich S.A., Geneva, Switzerland

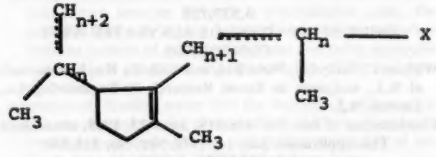
Filed Jan. 25, 1974, Ser. No. 436,786

Claims priority, application Switzerland, Feb. 9, 1973, 1941/73

Int. Cl.² C07C *69/07, 69/145, 69/24*

U.S. Cl. 260—488 R 9 Claims

1. Compounds of formula



containing a single or a double bond in the positions indicated by the dotted lines and wherein:

n stands for 0 or 1; and X represents a univalent radical of formula

$-CH_2OR^1$

wherein R^1 represents a hydrogen atom or an acyl radical derived from a fatty acid containing from 1 to 6 carbon atoms.

3,937,724

ORGANO-PHOSPHORUS COMPOUNDS CONTAINING PERFLUOROALKYL RADICALS AND THEIR APPLICATION TO CELLULOSIC TEXTILES

Leon H. Chance, and Jerry P. Moreau, both of New Orleans, La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 151,507, June 9, 1971, which is a division of Ser. No. 843,200, July 18, 1969, Pat. No. 3,639,144. This application Mar. 24, 1975, Ser. No. 561,587

Int. Cl.² C07F *9/38*

U.S. Cl. 260—502.4 P 1 Claim

1. 1-(1H,1H-perfluorooctyl)-1,3-trimethylenediphosphonic acid.

3,937,725

SULPHONIC ACID SALTS WITH ANTISTATIC ACTIVITY

Josef Pfeifer, Domat-Ems, GR, Switzerland, assignor to Inventa AG fur Forschung und Patenverwertung, Zurich, Switzerland

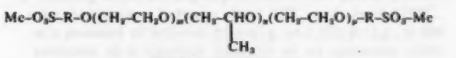
Filed Aug. 21, 1972, Ser. No. 282,283

Claims priority, application Switzerland, Sept. 6, 1971, 13013/71

Int. Cl.² C07C *143/11*

U.S. Cl. 260—513 R 2 Claims

1. A block copolymeric sulphonic acid salt of the general formula



in which Me is one equivalent of an alkali metal or alkaline-earth metal,

R is an alkylene group of 3–4 carbon atoms,

n is a whole number from 3–100

(m+p) is a whole number from 20–500

$$\frac{n}{(m+p)} = 0.15 \text{ to } 3.$$

3,937,726

UREA DERIVATIVES AND THEIR USE AS HERBICIDES

Otto Scherer, Bad Soden, Taunus; Gerhard Hörlein, Frankfurt am Main, and Hubert Schonowsky, Neu-Isenburg, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

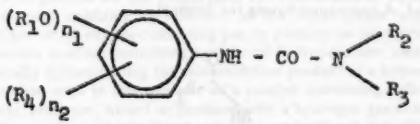
Continuation-in-part of Ser. Nos. 628,843, April 6, 1967, abandoned, and Ser. No. 799,088, Feb. 13, 1969, abandoned, and Ser. No. 800,748, Feb. 19, 1969, abandoned. This application May 26, 1970, Ser. No. 40,704

Claims priority, application Germany, Apr. 22, 1966, 48990; Apr. 22, 1966, 48991; Dec. 8, 1966, 50877; Dec. 14, 1966, 50938; Mar. 16, 1968, 1668116; Mar. 20, 1968, 1768002

Int. Cl.² C07C *127/19*

U.S. Cl. 260—553 A 2 Claims

1. A compound of the formula



wherein R_1 is haloalkyl having 2 to 5 carbon atoms, the halogen being selected from the group consisting of fluorine, chlorine, and bromine; n_1 is 1 or 2; R_2 is hydrogen or alkyl having 1 to 4 carbon atoms; R_3 is alkyl having 1 to 4 carbon atoms; R_4 is halogen, trifluoromethyl, or alkyl or alkoxy having 1 to 3 carbon atoms; and n_2 is 0, 1, 2, or 3.

3,937,727

PROCESS FOR PREPARING N, N-DIMETHYLUREA

Peter E. Throckmorton, Worthington; Sari Frey, and Dace Grote, both of Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed July 5, 1974, Ser. No. 485,835
Int. Cl.² C07C *127/15*
U.S. Cl. 260—553 R 6 Claims

1. A process for the preparation of N, N-dimethylurea which comprises reacting dimethylamine and urea neat in a molar ratio of not less than 2:1, respectively, under autogenous pressure and substantially anhydrous conditions at a temperature of from 110° to 150° C.

3,937,728

LOW-TEMPERATURE SYNTHESIS OF UREA

Richard L. Every, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 31,420, April 23, 1970, which is a continuation-in-part of Ser. No. 581,189, Sept. 22, 1966, abandoned. This application July 29, 1974, Ser. No. 492,663
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 R 1 Claim

1. A process for separating a mixture of urea and ammonium chloride produced in high yield with a low level of impurities by combining as reactants phosgene and ammonia at a temperature in the range of about −50°C to about −20°C by adding one reactant to the other and maintaining the mixture in said temperature range, then combining said mixture and methanol, dissolving said urea in said methanol and separating the resulting solution of urea from the relatively insoluble ammonium chloride.

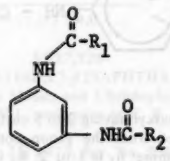
3,937,729

META-BIS ANILIDE DERIVATIVES AND THEIR UTILITY AS HERBICIDES

Eugene G. Teach, El Cerrito, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 180,916, Sept. 15, 1971, abandoned, which is a continuation of Ser. No. 20,104, March 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 741,267, July 1, 1968, abandoned, which is a continuation-in-part of Ser. No. 659,865, Aug. 11, 1967, abandoned. This application Mar. 19, 1973, Ser. No. 342,579
Int. Cl.² C07C *103/44, 103/64, 103/82*
U.S. Cl. 260—557 R 36 Claims

1. A compound having the formula



in which R_2 is halogenated lower alkyl, and R_1 is alkyl.

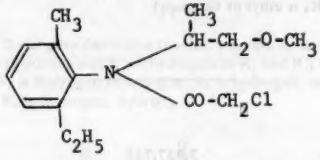
3,937,730

PLANT GROWTH REGULATING AGENT

Christian Vogel, Binningen, and Rudolf Aebi, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 366,955, June 4, 1973, abandoned. This application Oct. 4, 1974, Ser. No. 511,321
Claims priority, application Switzerland, June 6, 1972, 08345; Mar. 30, 1973, 04607
Int. Cl.² C07C *103/34*
U.S. Cl. 260—562 B 1 Claim

1. The compound 2-ethyl-6-methyl-N-(1'-methoxyprop-2'-yl)-N-chloroacetanilide of the formula



3,937,731

IMINE DERIVATIVES OF ALKYLATED ARYL COMPOUNDS

William C. Hollyday, Plainfield, and Shih-En Hu, Linden, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 466,419, June 23, 1965, abandoned. This application Jan. 14, 1972, Ser. No. 218,030
Int. Cl.² C07C *119/00*
U.S. Cl. 260—566 F 5 Claims

1. An oil-soluble additive having pour point depressing and sludge dispersing properties when added to a mineral lubricating oil, which comprises the product obtained by condensing a ketone, obtained by acylation of wax-alkylated naphthalene, with an alkylene polyamine at a temperature of from about 140° to 350°F. for a sufficient period of time to split out water and form a Schiff base and wherein:

said wax-alkylated naphthalene is the condensation product of naphthalene with a chlorinated paraffin wax of 12 to 40 carbon atoms chlorinated to about 10 to about 15 wt. % chlorine, wherein from about 9 parts of chlorinated paraffin wax is condensed per part of naphthalene, to about 100 parts by weight of chlorinated paraffin wax is condensed per 20 parts by weight of naphthalene,

said acylation being effected by mild oxidation by air blowing at temperatures in the range of about 160° to 480°F. for about 2 to 48 hours, of said wax-alkylated naphthalene, or by reaction with in the range of about 0.1 to about 1.0 molar proportion of an acyl halide or acid anhydride of a C_2 to C_{10} monocarboxylic acid per molar proportion of wax-alkylated naphthalene,

said alkylene polyamine having 2 to 12 nitrogen atoms, and wherein pairs of nitrogen atoms are joined by alkylene groups of 2 to 4 carbon atoms,

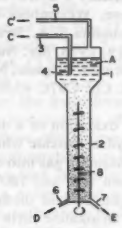
and in the range of about 0.2 to about 1.5 molar proportion of polyamine is condensed per molar proportion of acylated wax-alkylated naphthalene.

3,937,732

OXAMIDE BY HYDROLYSIS OF CYANOGEN

Shun-Ichi Uchida, and Shigeru Ogawa, both of Tokyo, Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Division of Ser. No. 324,791, Jan. 18, 1973, abandoned, which is a continuation of Ser. No. 56,455, July 20, 1970, abandoned.
This application Apr. 9, 1974, Ser. No. 459,361
Claims priority, application Japan, July 21, 1969, 44-57071
Int. Cl.² C07C *103/34*
U.S. Cl. 260—561 R 1 Claim



1. A process for the continuous production of oxamide by hydrolysis of cyanogen, said process comprising:

providing a reaction zone having therein an aqueous solution containing mineral acid as a hydrolizing agent;

continuously feeding into said reaction zone gaseous cyanogen and contacting said gaseous cyanogen with said aqueous solution to form solid precipitates of oxamide;

passing said precipitates of oxamide formed in said reaction zone down into an through a precipitation zone, the precipitation zone being in contiguous communication with the bottom of said reaction zone and being equipped with a stirrer means arranged coaxially only in said precipitation zone;

continuously feeding water into the bottom of said precipitation zone and passing it upwardly therethrough into said reaction zone and washing said solid precipitates of oxamide by said water in said precipitation zone;

continuously removing said solid precipitates of oxamide washed by said water as cake or slurry from the bottom of said precipitation zone; and

the amount of water fed into the bottom of said precipitation zone being the sum of the amount of water consumed in the reaction of hydrolysis of cyanogen in said reaction zone and the amount of water accompanied with the oxamide taken out as cake or slurry.

3,937,733

SALTS OF IODOMETHANESULFONIC ACID WITH ORGANIC BASES

Hermann Ulbrich, and Wolfgang Beich, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Mar. 31, 1972, Ser. No. 239,937
Claims priority, application Germany, Apr. 2, 1971, 2117014
Int. Cl.² C07C *143/02*
U.S. Cl. 260—501.19 11 Claims

1. A myelographic salt of iodomethanesulfonic acid with an amine selected from the group consisting of glucamine, N-alkylglucamine, N,N-dialkylglucamine and hydroxyalkylglucamines of the latter and former alkylglucamines containing more than one carbon atom in the alkyl radical, said amine in all cases having up to a total of four carbon atoms in the alkyl portion.

3,937,734

PROCESS FOR PRODUCING DECACHLOROOCTAHYDRO-1,3,4-METHENO-2H-CYCLOBUTA-(C,D)-PENTALEN-2-ONE

William Percy Moore, Hopewell, and Virgil Anton Hundtofte, Chester, both of Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Jan. 3, 1975, Ser. No. 538,493
Int. Cl.² C07C *45/00*
U.S. Cl. 260—586 R 10 Claims

1. A process for producing decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(c,d)-pentalen-2-one in at least 95% yield, which comprises:

a. reacting hexachlorocyclopentadiene and sulfur trioxide at a temperature between about 95°C. and about 120°C., at a pressure of between 50 p.s.i.g. and 300 p.s.i.g., in the presence of a catalytic quantity of an antimony compound selected from the group consisting of trivalent and pentavalent antimony halides, oxides and oxy acids, the mol ratio of sulfur trioxide to hexachlorocyclopentadiene being about 1.5 and 2, to form a reaction product thereof; said reacting step being further characterized in that an admixture of the hexachlorocyclopentadiene and the antimony compound is first formed, the sulfur trioxide is added to said admixture to form the reaction mixture, the reaction temperature is maintained below 105°C. during addition of the sulfur trioxide, and the reaction mixture is reacted until it turns to a black color;

b. hydrolyzing the reaction product from step (a) in at least about 5 parts by weight of an aqueous solution containing dissolved caustic alkali and having a pH of at least 9, per part by weight of reaction mixture, said hydrolysis being carried out at a temperature between about 85°C. and about 115°C. for at least about 30 minutes until all solids have gone into solution;

c. acidifying the hydrolysis mixture from step (b) with a mineral acid to pH 5–6;

d. digesting the acidified hydrolysis mixture at pH 5–6 at a temperature between about 85°C. and about 105°C. for at least 1 hour, until the decachlorooctahydro-1,3,4-metheno-2H-cyclobuta(c,d)-pentalen-2-one is completely precipitated as a crystalline product; and

e. recovering the crystalline product from the digestion mixture.

3,937,735

PROCESS FOR THE PREPARATION OF CYCLOHEXANONE

Peter L. M. Dols, Geleen, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Nov. 21, 1973, Ser. No. 418,021
Claims priority, application Netherlands, Nov. 23, 1972, 7215853
Int. Cl.² C07C *27/04, 27/12, 45/16, 45/02*
U.S. Cl. 260—586 P 4 Claims

1. A process for the preparation of cyclohexanone which comprises oxidizing cyclohexane in the liquid phase with oxygen or an oxygen-containing gas, to produce an oxidation reaction product containing cyclohexyl hydroperoxide, catalytically hydrogenating the said oxidation product in a hydrogenation zone in the presence of a catalyst containing palladium, platinum, nickel or rhodium with a hydrogen gas-containing stream, obtained as hereinafter set forth, whereby the said cyclohexyl hydroperoxide is converted substantially to cyclohexanol, recovering the cyclohexanol fraction by distillation and catalytically dehydrogenating the said cyclohexanol, to cyclohexanone and hydrogen, separating the said cyclohexanone and passing the resulting hydrogen gas-containing stream to the said hydrogenating zone to effect the said hydrogenation of the oxidation product.

3,937,736

BENZOBICYCLOALKANE AMINES

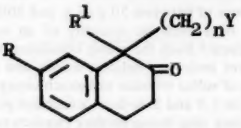
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 262,849, June 14, 1972, Pat. No. 3,836,670, which is a continuation-in-part of Ser. No. 200,511, Nov. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 94,983, Dec. 3, 1970, abandoned. This application Dec. 3, 1973, Ser. No. 421,374

Int. Cl.² C07C *49/76*

U.S. Cl. 260—590 FA 14 Claims

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, lower alkyloxy, phen(lower)-alkyloxy, halogen, or trifluoromethyl; R^1 is lower alkyl, lower alkenyl, or phen(lower)alkyl; Y is chlorine or bromine; and *n* is an integer of from 3 to 5.

3,937,737

PROCESS FOR THE MANUFACTURE OF AROMATIC 1,3-DIKETONES

Kurt Eiglmeier, Idstein, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

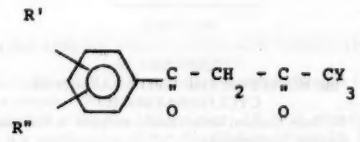
Filed July 22, 1974, Ser. No. 491,476

Claims priority, application Germany, July 23, 1973, 2337396

Int. Cl.² C07C *49/76, 49/80*

U.S. Cl. 260—592 3 Claims

1. A compound of the formula



wherein R′ and R″ each is hydrogen or alkyl and R′ and R″ together contain 6 to 12 carbon atoms, and each Y is hydrogen, fluorine, chlorine or bromine.

3,937,738

(PERHALOALKYL) THIO-SUBSTITUTED ALDEHYDES AND KETONES

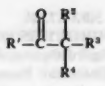
James R. Throckmorton, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 25, 1974, Ser. No. 464,492

Int. Cl.² C07C *49/16, 47/14*

U.S. Cl. 260—593 H 5 Claims

1. A compound of the formula:



wherein R′ is $-CH_3$ or $-CH_2SCF_3$; R^2 and R^3 are H or $-CH_3$; and R^4 is $-CH_3$, CF_3S or $CFCl_2S-$, except that when R′ is $-CH_3$, R^4 is not $-CH_3$.

3,937,739

HYDROCARBON CONVERSION

Pierre M. J. G. de Radzitzky d'Ostrowick, Brussels, and Philippe J. A. Camerman, Wezembeek-Oppem, both of Belgium, assignors to Labofina S. A., Brussels, Belgium

Filed June 19, 1973, Ser. No. 371,398

Claims priority, application Belgium, May 4, 1973, 130730

Int. Cl.² C07C *45/02*

U.S. Cl. 260—604 R 11 Claims

1. A process for the oxidation of a diethylbenzene feed to form diethylbenzene hydroperoxide which comprises passing a molecular oxygen containing gas into contact with said feed at a temperature between 100° and 180°C. in the presence of 0.01 to 5.0%, by weight, of said diethylbenzene feed, of a superbasic sulfonate of an alkaline earth metal of the formula:

$$R-Y-M-CO_3-(M-CO_3)_x-M-SO_3R$$

wherein R is a hydrocarbon radical having at least 18 carbon atoms, Y is selected from the group consisting of CO_3 and SO_3 radicals, M is selected from the group consisting of barium, calcium and magnesium, and X is an integer between 0 and 8.

3,937,740

PROCESS FOR THE MANUFACTURE OF 2,3,6-TRIMETHYLPHENOL

Wolf Brenner, Fullinsdorf; Herbert Lindlar, Reinach, and Rudolf Hinderling, Riehen, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 28, 1974, Ser. No. 455,821

Claims priority, application Switzerland, Apr. 5, 1973, 4918/73

Int. Cl.² C07C *39/06*

U.S. Cl. 260—621 R 6 Claims

1. A process for producing 2,3,6-trimethylphenol comprising reacting m-cresol with methanol wherein the m-cresol and methanol are present in the gas phase, said reaction taking place in the presence of a catalyst system composed of 24 parts by weight of said catalyst system of magnesium in the form of magnesium oxide, 2 to 15 parts by weight of said catalyst system cerium in the form of ceric oxide, 1 to 5 parts by weight of said system of zinc in the form of zinc oxide and 0.1 to 1.5 parts by weight of said system of metal selected from the group consisting of an alkali metal, barium, calcium or strontium wherein said metal is in the form of its oxide wherein the reaction is carried out at a temperature of from about 300°C and about 520°C and at a pressure of from 1 atmosphere to about 10 atmosphere.

3,937,741

PRODUCTION OF HYDROQUINONE

Nicholas P. Greco, Edgewood, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 267,534, June 29, 1972, Pat. No. 3,862,247, which is a continuation-in-part of Ser. No. 16,545, March 4, 1970, abandoned. This application Jan. 20, 1975, Ser. No. 542,605

Int. Cl.² C07C *39/10*

U.S. Cl. 260—621 M 6 Claims

1. A process for the manufacture of hydroquinone from nitrobenzene which compreses the steps of:

a. subjecting a solution of nitrobenzene in an aqueous sulfuric acid electrolyte at a temperature of 50° to 80°C to electrolytic reduction, thereby forming amino products,

b. subjecting said electrolyte containing said amino products to hydrolysis at a temperature of 200° to 300°C for a period of time sufficient to hydrolyze said amino products to hydroquinone,
c. cooling said hydrolysis solution, and
d. extracting hydroquinone from said solution with a water immiscible organic solvent.

3,937,742
HYDROFORMYLATION PROCESS USING CATALYST COMPRISING PLATINUM GROUP METAL ON SUPPORT HAVING SEPARATE ALUMINA PHASE

Jin Sun Yoo, South Holland, Ill., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 17,335, March 6, 1970, abandoned. This application Feb. 7, 1975, Ser. No. 547,838
Int. Cl.² C07C *27/22*
U.S. Cl. 260—632 HF **5 Claims**

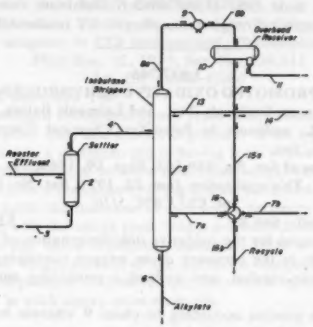
1. In a process for the hydroformylation reaction of an aliphatic monoolefin hydrocarbon of 2 to about 16 carbon atoms in the liquid phase, the improvement which comprises conducting said hydroformylation reaction in contact with a catalyst composition which comprises a minor, catalytically effective amount of a noble metal selected from; the group consisting of rhodium, ruthenium, platinum, and palladium on a major amount of a solid, acidic, silica-based support of silica-alumina containing a separate phase of alumina, the total catalyst composition containing 0.001 to 1 weight per cent of said noble metal, said support being calcined and comprising 45 to 95 weight per cent amorphous acidic silica-alumina having a Cat-A activity of at least 20 and about 5 to 55 weight per cent of said separate phase of alumina, said alumina resulting from the calcination of a mixture of amorphous hydrous alumina, and alumina monohydrate, the total alumina content of said support being about 20 to 70 weight per cent, said support being prepared by mixing together a separate phase alumina hydrogel with a silica-alumina hydrogel, dewatering the mixture to provide a gel slurry of about 14 weight per cent solids, spray-drying said slurry, washing the spray-dried material, pelletting the washed material, and calcining the pellets at about 1350°F. for about 3 hours to provide calcined particles, said support containing less than 1.5 weight per cent sodium, said reaction being conducted at a temperature of from about 100° to 550°C. at a pressure up to about 2500 psig at an hourly velocity of weight of aliphatic monoolefin hydrocarbon per weight of catalyst of from about 0.5 to about 10, the hydrogen to carbon monoxide mol ratio being from about 1:1 to about 5:1.

3,937,743
MAINTAINING HF SOLUBILITY IN ALKYLATION ISOBUTANE RECYCLE

Jay E. Sobel, Highland Park, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 18, 1975, Ser. No. 550,897
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.48 **6 Claims**

1. In a process for producing an alkylation reaction product by reacting an isobutane reactant stream with an olefin-acting reactant stream in contact with an HF acid catalyst wherein said reactant streams are initially combined with an acid saturated recycle stream, as hereinafter defined, and then contacted with said HF acid catalyst in a reaction zone at alkylation conditions; a resulting reactor effluent is settled to form an acid phase and a hydrocarbon phase; said hydrocarbon phase is separated to provide a vaporous overhead stream, a vaporous product stream containing principally n-butane, and a liquid alkylation reaction product stream; said vaporous overhead stream is condensed, cooled to a separation temperature, and separated to provide an overhead product stream, a reflux stream, an acid liquid stream, and an acid saturated recycle stream including isobutane and entrained acid; and said acid saturated recycle stream is combined with said reactant streams as previously indicated; the improvement which comprises heating said acid saturated recycle stream to a



temperature sufficient to place said entrained acid in solution therein prior to said combination of said acid saturated recycle stream with said reactant streams.

3,937,744
VINYL CHLORIDE PROCESS

Herbert Riegel, Maplewood, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 831,414, June 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 614,338, Feb. 6, 1967, abandoned. This application June 15, 1971, Ser. No. 153,374
Int. Cl.² C07C *21/02*
U.S. Cl. 260—656 R **43 Claims**

1. A process for producing vinyl chloride, comprising:
a. contacting at a temperature of from about 700°F to about 1200°F a feed comprising a member selected from the group consisting of ethane, ethylene and mixtures thereof with a melt comprising a multivalent metal chloride in both its higher and lower valence state to produce a reaction effluent comprising vinyl chloride and 1,2-dichloroethane, said multivalent metal chloride being selected from the group consisting of the chlorides of copper, chromium, cobalt, manganese and iron;
b. recovering 1,2-dichloroethane and vinyl chloride from the reaction effluent;
c. dehydrochlorinating at a temperature of from about 700°F to about 1200°F recovered 1,2-dichloroethane to vinyl chloride by contacting the 1,2-dichloroethane with a melt comprising a multivalent metal chloride in both its higher and lower valence state in an amount effective to catalyze the dehydrochlorination of 1,2-dichloroethane to vinyl chloride, said multivalent metal chloride being selected from the group consisting of the chlorides of copper, chromium, cobalt, manganese and iron.

3,937,745
SELECTIVE HYDROGENATION OF CYCLOPENTADIENE

Lawson G. Wideman, Akron, and Henry R. Menapace, Stow, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 29, 1974, Ser. No. 501,534
Int. Cl.² C07C *5/02*; B01D *31/12*
U.S. Cl. 260—666 A **6 Claims**

1. In the method of selective hydrogenation of cyclopentadiene which comprises contacting cyclopentadiene with hydrogen and in contact with a homogeneous catalyst, the improvement which comprises utilizing as a homogeneous catalyst a mixture consisting of an aluminum trialkyl and an organonickel compound selected from the group consisting of nickel salts of carboxylic acids, nickel acetyacetonate, nickel

salicaldehyde, bis(salicaldehyde) nickel, ethylene diamine nickel, bis(α-furyl dioxime) nickel and nickel tetracarbonyl in which the mole ratio of the trialkyl aluminum compound-/nickel compound ranges from about 1.5/1 to about 10/1.

3,937,746

SULFUR PROMOTED OXIDATIVE DEHYDROGENATION

Louis J. Croce, Seabrook, Tex., and Laimonis Bajars, Princeton, N.J., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 859,565, Sept. 19, 1969, Pat. No. 3,666,687. This application June 23, 1971, Ser. No. 156,086

Int. Cl.[2] C07C *5/20*

U.S. Cl. 260—669 R **52 Claims**

1. A process for the oxidative dehydrogenation of organic compounds in the presence of an oxygen containing gas, a metal ferrite catalyst, and at least a promoting amount of sulfur.

10. The process according to claim 9 wherein butene is oxidatively dehydrogenated.

32. A process for the dehydrogenation of ethylbenzene to styrene comprising:

contacting ethylbenzene and SO_2 in the vapor phase under dehydrogenation conditions with a catalyst comprising:

a ferrite of the spinel form having the formula

$A_aA'_bFe_cO_4$

where A has a valence of plus 2 and is a metal selected from the group consisting of cobalt, nickel, zinc and magnesium; A′ has a valence of plus 3 and is selected from the group consisting of chromium and lanthanum; *a* has a value from 0.1 to about 3; *b* has a value from 0 to less than 2; *c* has a value from greater than 0 to about 3; and *a+b+c* has a value of 3; or a ferrite of the perovskite form having the formula

$B_dCr_eFe_fO_3$

where B has a valence of plus 3 and is selected from lanthanum and yttrium; *d*, *e* and *f* are each values from 0.5 to 1.5 and the sum of *d*, *e*, and *f* is 2.

3,937,747

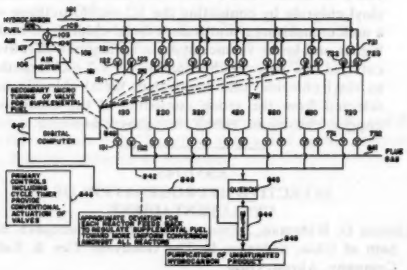
BALANCING ADIABATIC REACTORS

Bruce C. Thornton, Houston, Tex.; Michael B. Albert, Bala Cynwyd, and G. Richard Worrell, Media, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 18, 1974, Ser. No. 462,014

Int. Cl.[2] C07C *5/36*

U.S. Cl. 260—680 R **5 Claims**



1. In a method of preparing unsaturated hydrocarbons from a gaseous hydrocarbon feedstock, wherein during a complete cycle the feedstock is directed through a dehydrogenation system comprising *n* adiabatic reactor beds in parallel, *n* being the number of adiabatic reactor beds in said system, said *n* having the same numerical value throughout said system, and wherein the dehydrogenation effluent from each of the *n* adiabatic reactor beds is mixed and directed through a quenching zone to provide a mixed, quenched product stream, which during the complete cycle time for one adiabatic reactor bed contains the mixture of product from all of said adiabatic reactor beds, said cycle time being arbitrarily divided into n instances of 1/nth of the cycle time, said system comprising primary controls for conducting said dehydrogenation to seek from each of said adiabatic reactor beds a targeted conversion of hydrocarbon feedstock, the improvement which consists of:

making a series of n measurements of a characteristic indicative of the conversion of hydrocarbon feedstock during 1/nth of cycle time;

determining the average characteristic indicative of the conversion from the n instances of thus measured characteristic of conversion, said time average characteristic indicative of the conversion being a measurement of the average conversion of all reactors during said cycle time;

determining the approximate positive or negative deviation of measurement of a characteristic indicative of conversion from said average characteristic indicative of conversion, said deviation being determined for each of the *n* time periods;

utilizing said n deviations of time periods to determine for the adiabatic reactor bed imminently scheduled for regeneration the approximate positive or negative deviation of said adiabatic reactor bed from said average characteristic indicative of conversion;

determining for the adiabatic reactor bed imminently scheduled for regeneration the deviation of said targeted conversion from said average characteristic indicative of conversion;

generating for each adiabatic reactor bed as it is imminently scheduled for regeneration a summation signal indicative of the summation of conversion deviation of targeted conversion from average characteristic indicative of conversion and said approximate positive or negative deviation of said adiabatic reactor bed from said average characteristic indicative of conversion and generating a positive or negative correction signal related to said summation signal;

utilizing said correction signal for adjusting the temperature of the regeneration gas to said reactor during said scheduled regeneration at conditions adapted to restore as closely as feasible the conversion in said reactor in the subsequent cycle to said targeted conversions; and

repeating such adjustment of the temperature of the regeneration gas to each reactor for each regeneration to maximize approach toward targeted conversion.

3,937,748

OXIDATIVE DEHYDROGENATION USING GEL PRECIPITATED CATALYST PREPARATION

Edward J. Miklas, Conroe, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 365,916, June 1, 1973, Pat. No. 3,849,545, which is a continuation-in-part of Ser. No. 122,162, March 8, 1971, abandoned. This application Aug. 26, 1974, Ser. No. 500,243

Int. Cl.[2] C07C *5/48*

U.S. Cl. 260—680 E **18 Claims**

1. In a process for the oxidative dehydrogenation of organic compounds having at least two adjacent, hydrogen containing carbon atoms in the presence of a catalyst wherein the improvement comprises utilizing a zinc ferrite catalyst prepared by the steps of (a) contacting a solution of a soluble metal component comprising zinc and iron with a precipitating agent to precipitate an insoluble metal component comprising zinc and iron, said solution containing in addition to the soluble metal component from 0.1 to 11 weight percent of a soluble polyhydric organic compound based on the weight of metal and (b) calcining the precipitate to form said zinc ferrite oxidative dehydrogenation catalyst, wherein the precipitating agent is a solution of a hydroxide of a metal selected from the group consisting of Li, Na, K, Rb, and Cs, said precipitating

solution having a normality of between 2 and 4 and said polyhydric compound contains at least 2 hydroxyl groups and is selected from the group consisting of organic alcohols, polyesters, polyethers, polysaccharides and mixtures thereof having a molecular weight of at least about 3,000.

3,937,749

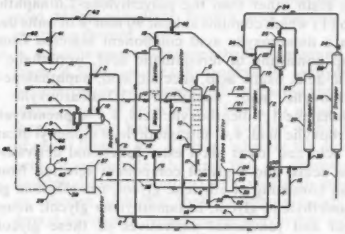
HF ALKYLATION REACTION TEMPERATURE CONTROL

Robert F. Zabransky, Oak Brook, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 468,955, May 10, 1974. This application Nov. 29, 1974, Ser. No. 528,390

Int. Cl.² C07C *3/54*

U.S. Cl. 260—683.48 **6 Claims**



1. A process for alkylating an isoparaffin with an olefinic feed stream containing at least two olefins, which process comprises the steps of:

a. reacting said isoparaffin with said feed stream in admixture with a hydrogen fluoride catalyst, in an alkylation reaction zone, at alkylating conditions resulting in a reaction product effluent containing normally liquid alkylate;

b. regulating the temperature of the reaction mixture, within said reaction zone, through indirect contact of said reaction mixture with a cooling medium passing through conduit means through said reaction zone, the flow of said cooling medium being adjusted by first flow-varying means connected to said conduit means;

c. separating said reaction product effluent into a hydrocarbon phase and an acid phase;

d. recycling a first portion of said hydrocarbon phase to said reaction zone, the flow of said first portion of hydrocarbon phase being adjusted by second flow-varying means connected to the recycle conduit to said reaction zone;

e. recovering said normally liquid alkylate from a second portion of said hydrocarbon phase;

f. introducing a sample of said alkylate into a hydrocarbon analyzer and developing therein a first output signal which is representative of a composition characteristic of said sample; and,

g. transmitting said first output signal to comparator means which compares the rate of change and actual value of said composition characteristic, said comparator generates a second output signal and transmits said second output signal to at least one of two signal-receiving means, the first of said signal-receiving means transmits said second signal to said first flow-varying means, whereby the flow of cooling medium passing throus said conduit means is adjusted, and the second of said signal-receiving means transmits said second signal to said second flow-varying means, whereby the flow of said recycled hydrocarbon phase through said recycle conduit is adjusted in response to said composition characteristic.

3,937,750

PERFLUORO COMPOUND-SOIL RESISTANT EPOXY RESIN COMPOSITIONS

Philip Bernstein, Yardley, Pa., and John P. Stirpe, Trenton, N.J., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Dec. 12, 1973, Ser. No. 426,611

Int. Cl.² C08G *45/00*

U.S. Cl. 260—830 TW **10 Claims**

1. Perfluoro compound-epoxy resin compositions comprising an epoxy resin and a block copolymer of the type (ABA)$_n$ wherein A is a perfluoro group having from about 8 to about 10 carbon atoms, B is a low molecular weight functionality, derived from a compound having at least sufficient stoichiometry to fulfill the functions of two active hydrogens, which is reactive with the epoxy resin, and n is from 1 to about 5 and wherein the block copolymer comprises from about 0.5 to about 10 weight percent of the perfluoro compound - epoxy resin composition, and more than one vicinal epoxy group is present in each epoxy resin molecule.

3,937,751

CURABLE COMPOSITIONS BASED ON EPOXIDE RESINS AND POLYESTER-TRICARBOXYLIC ACIDS OR -TETRACARBOXYLIC ACIDS

Rolf Schmid, Gelterkinden; Friedrich Lohse, Oberwil; Willy Fatzer, Bottmingen, and Hans Batzer, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 6, 1974, Ser. No. 530,334

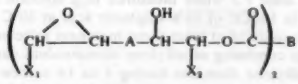
Claims priority, application Switzerland, Dec. 19, 1973, 17807/73

Int. Cl.² C08L *63/00*

U.S. Cl. 260—835 **16 Claims**

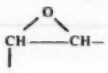
1. A curable epoxide resin composition based on adducts containing epoxide groups and polyester-tricarboxylic acids and/or -tetracarboxylic acids, characterised in that it comprises

a. at least 60 per cent by weight, based on the total amount of epoxide resin, of adducts containing epoxide groups, of the formula I



(I)

wherein X_1 and X_2 each denote hydrogen or methyl and A denotes the radical, obtained by removal of the 1,2-epoxyethyl groups of a diglycidyl compound, or wherein A together with X_1 and/or X_2 and with inclusion of the grouping

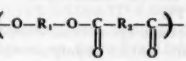


and/or

denotes the cycloaliphatic ring or the cycloaliphatic ring system of a partially reacted cycloaliphatic or cycloaliphatic-aliphatic diepoxide compound, B denotes a long-chain polyester radical obtained by removing both carboxyl groups from a polyester dicarboxylic acid in which unsubstituted or substituted alkylene and/or alkenylene chains alternate with carboxylic acid ester groups, and the quotient Z/Q, wherein Z is the number of carbon atoms present in the recurring structural element of the radical B and Q is the number of oxygen bridges present in the recurring structural element of the radical

B, has to be at least 4 and, furthermore, the total number of carbon atoms present in the radical B is at least 50, and

b. as curing agents, linear or slightly branched polyesters possessing 3 or 4 terminal carboxyl groups and having an average molecular weight of 600 – 6,000, which contain at most 30, structural elements of the formula II



(II)

wherein R_1 and R_2 denote divalent aliphatic, araliphatic, cycloaliphatic, cycloaliphatic-aliphatic, aromatic or heterocyclic-aliphatic radicals, and at least one of the two radicals R_1 or R_2 has to contain a carbocyclic or heterocyclic ring or a carboxylic or heterocyclic ring system and not more than 4 methylene groups are present in the structural element per ring, component (b) being present in an amount such that 0.7 – 1.2 equivalents of carboxyl groups are present in the mixture per 1 equivalent of epoxide groups.

3,937,752

HOMOPOLYAMIDE AND TERPOLYAMIDE BLEND

Hiroshi Ueno, Kawasaki, and Tetsuo Tsukamoto, Higashirokugo, both of Japan, assignors to Toyo Seikan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 13,892, Feb. 25, 1970, abandoned. This application Dec. 6, 1972, Ser. No. 312,651
Claims priority, application Japan, Mar. 6, 1969, 44-16463
Int. Cl.² C08L 77/00
U.S. Cl. 260—857 TW 6 Claims

1. An adhesive composition for bonding together metal sheets, said composition being a homogeneous blend consisting essentially of:

I. a crystalline linear homopolyamide selected from the group consisting of polyhexamethylene adipamide, poly ε-caprolactam, polyhexamethylene sebacamide, poly ω-undecamide, and poly ω-dodecamide, of a relative viscosity of at least 1.5 when measured in a solution of 1 g polymer in 100CC of 98% sulphuric acid at 20°C and

II. a copolyamide of at least three members selected from the group consisting of alkylene diammonium carboxylates of alkylene diamines having 4 to 14 carbon atoms and alkylene dicarboxylic acids having 4 to 14 carbon atoms, and alkylene amino carboxylic acids having 4 to 14 carbon atoms,

in a ratio by weight of (I): (II) from 99:1 to 90:10.

3,937,753

ACID DYEABLE POLYESTERS

Maneung Hahn, Akron; Leroy C. T. Lin, Uniontown, and William C. T. Tung, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 23, 1975, Ser. No. 543,399
Int. Cl.² C08G 63/36; C08L 67/02
U.S. Cl. 260—860 9 Claims

1. A block polymer containing blocks of polyethylene terephthalate and polymer blocks selected from the group consisting of (A) blocks of a polymer of diacid having the hydantoin nucleus in its structure and cyclohexyl diethanolamine and (B) blocks of a polymer of diacid having the hydantoin nucleus in its structure and a mixture of cyclohexyl diethanol amine and a diol selected from the group consisting of hydantoin diol, a polymethylene diol containing from 2 to 10 methylene groups and polyether diols.

3,937,754

BIAXIALLY ORIENTED POLYETHYLENE-2,6-NAPHTHALATE FILM CONTAINING ANOTHER POLYESTER RESIN AND PROCESS FOR ITS PRODUCTION

Sakae Shimotsuma; Takeo Asai; Masahiro Hosoi, all of Sagamihara; Hiroshi Aoki, and Masanori Masuda, both of Ogaki, all of Japan, assignors to Teijin Ltd, Osaka, Japan

Filed July 23, 1973, Ser. No. 381,580
Claims priority, application Japan, July 25, 1972, 47-73803
Int. Cl.² C08G 39/02
U.S. Cl. 260—860 3 Claims

1. A biaxially oriented polyethylene-2,6-naphthalate film, which comprises a blended mixture of

1. a polyethylene-2,6-naphthalate resin having a unit derived from not more than 10 mol % of a polyester-forming component other than a polyethylene-2,6-naphthalate-forming component, and (2) 0.5 to 10% by weight, based on the polyethylene-2,6-naphthalate resin (1), of a polyester resin other than the polyethylene-2,6-naphthalate resin (1) which contains at least 90 mol % of units derived from a dicarboxylic acid component selected from the group consisting of terephthalic acid, isophthalic acid, adipic acid, oxalic acid, succinic acid, naphthalene-2, 6-dicarboxylic acid, naphthalene-2,7-dicarboxylic acid, naphthalene-1,5-dicarboxylic acid, 4,4′-diphenoxyethane dicarboxylic acid, 4,4′-tetramethylene diphenyl dicarboxylic acid and lower alkyl ester functional derivatives of these acids, and a glycol component selected from the group consisting of ethylene glycol, trimethylene glycol, tetramethylene glycol, hexamethylene glycol, neopentyl glycol and functional derivatives of these glycols, in which the amount of the homopolyester unit is at least 90 mol %,

said film having a softening point at least 1°C. higher than its equilibrium softening point.

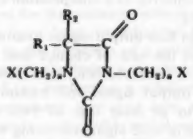
3,937,755

POLYESTERS HAVING IMPROVED DISPERSE DYEABILITY

Maneung Hahn, Akron; Leroy C. T. Lin, Uniontown, and William C. T. Tung, Tallmadge, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 23, 1975, Ser. No. 543,400
Int. Cl.² C08G 63/16; C08L 67/02
U.S. Cl. 260—860 6 Claims

1. A polyethylene terephthalate block copolyester in which the copolyester comprises a polymer of a derivative of a hydantoin diacid and a hydantoin diol having the general formula



where R_1 and R_2 are hydrogen, alkyl, aryl, aralkyl and heterocyclic compounds, n and n' are integers from 1 to 10 and X is —OH in the hydantoin diol and —COOH in the hydantoin diacid said copolyester block being present in the polyethylene terephthalate block copolyester in an amount of from 1 to 20 percent by weight of said block copolyester.

3,937,756
FIRE RETARDANT POLYESTER RESINS

Howard Paul Klein, and Harold George Waddill, both of Austin, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.

Filed May 24, 1974, Ser. No. 473,000
Int. Cl.² C08L 67/06
U.S. Cl. 260—869 **13 Claims**

1. A process for making a fire retardant infusible cured polyester bromine-containing resin comprising the steps of:

initially forming a bromine containing polyester resin having ester groups derived from an ethylenically unsaturated dicarboxylic acid or acid anhydride in the polyester chain by simultaneously mixing and reacting

a. polyhydric alcohol selected from the group consisting of aliphatic glycols having from 2 to 10 carbon atoms and aliphatic glycol ethers having from 4 to 20 carbon atoms;

b. an ethylenically unsaturated dicarboxylic acid or acid anhydride selected from the group consisting of maleic acid, maleic anhydride, fumaric acid, itaconic acid, and mixtures thereof, and

c. a 4,5-dibromohexahydrophthalic compound selected from 4,5-dibromohexahydrophthalic anhydride and 4,5-dibromohexahydrophthalic dicarboxylic acid at a temperature of from about 100°C to about 175°C to form a product having an acid number within the range of about 0 to 40 mg. KOH/g., wherein the dicarboxylic acid or anhydride (b) and the 4,5-dibromohexahydrophthalic compound (c) are collectively employed in an amount such that there is approximately one hydroxyl equivalent based on the polyhydric alcohol (a) per carboxyl equivalent and wherein the 4,5-dibromohexahydrophthalic compound (c) is present in an amount of from about 5 to about 25 mole percent of the total dicarboxylic acids (b) and (c);

mixing the resulting polyester resin with a cross linking agent which is a polymerizable monomer having terminal ethylenic unsaturation; and,

curing the resultant mixture to produce said fire retardant infusible cured polyester.

3,937,757
MOLDING COMPOSITIONS OF POLYBUTYLENE TEREPHTHALATE AND OLEFIN POLYMER

Wolfgang Seydl, Frankenthal, and Erich Strickle, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 5, 1974, Ser. No. 503,522
Int. Cl.² C08L 67/06
U.S. Cl. 260—873 **10 Claims**

1. Molding compositions based on polybutylene terephthalate and containing, based on the total weight of the molding composition, from 5 to 50% by weight of an olefin polymer selected from the group consisting of polyolefins and olefin polymers containing at least 50% by weight of olefin units, said olefin polymer having a melt index of from 0.01 to 100 as measured at a temperature of 190°C 2nd under a load of 2.16Kg.

3,937,758
PROCESS FOR THE PRODUCTION OF HIGH IMPACT COMPOSITIONS OF POLYETHYLENE AND POLYPROPYLENE BLOCK COPOLYMERS

Eugene G. Castagna, Clark, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 344,683, March 26, 1973. This application July 1, 1975, Ser. No. 592,145
Int. Cl.² C08L 51/00, 53/00, 23/00
U.S. Cl. 260—876 B **5 Claims**

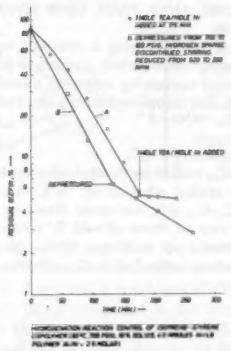
1. A process for the preparation of a binary polypropylene composition having synergistic impact properties which comprises:

1. polymerizing propylene in a slurry in the presence of a catalytic amount of a catalyst formed by admixing a subhalide of a metal selected from the metals of Groups IV*a*, V*a* and VI*a* of the Periodic Table according to Mendeleef and an aluminum compound containing at least one carbon to metal bond to a solids content of 10 to 60 percent by weight to form a polypropylene preblock;
2. removing any volatiles present with said preblock to a level of no more than 5 percent by weight;
3. transferring said preblock while it still contains active catalyst to a continuously agitated reaction zone;
4. introducing ethylene and another α-olefin having from 3 to 8 carbon atoms to said reaction zone;
5. block copolymerizing said ethylene and other α-olefin onto said preblock in the vapor phase to form a random copolymer post block having from about 25 to about 75 mole percent ethylene derived units and constituting from about 5 to about 40 percent by weight of the total block copolymer;
6. deashing the block copolymer thus produced;
7. transferring the deashed copolymer to at least one agitated drying zone;
8. introducing a linear polyethylene having a melt index between about 0.5 and about 0.9 and a density of at least 0.93 to the drying zone in an amount corresponding to between about 3 and about 15 percent by weight of the total of the linear polyethylene component and the block copolymer component, and
9. recovering the polypropylene composition from said drying zone.

3,937,759
HYDROGENATION PROCESS

Herman J. Baumgartner, Cypress, and Jaroslav G. Balas, Palos Verdes Penn., both of Calif., assignors to Shell Oil Company, Houston, Tex.

Filed May 1, 1974, Ser. No. 465,771
Int. Cl.² C08C 19/02
U.S. Cl. 260—879 **10 Claims**



1. In the process for the hydrogenation of polymers of olefinically unsaturated hydrocarbons wherein the hydrocarbons are hydrogenated in the presence of a catalyst comprising the reaction product of 1.0–5.0 moles of an aluminum trihydrocarbyl per mole of an alkoxide or carboxylate of a metal of the group consisting of cobalt, nickel, iron or mixtures thereof, the improvement comprising hydrogenating the hydrocarbon and thereafter reversibly interrupting the hydrogenation by injection of supplementary aluminum trihydrocarbyl in an amount between 0.75 and 2.5 moles per mole of cobalt, nickel or iron.

3,937,760
PROCESS FOR PRODUCING MULTIBLOCK COPOLYMER AND PRODUCTS PRODUCED THEREBY

William Max Cole, Norton, and Shingo Futamura, Seville, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Apr. 29, 1974, Ser. No. 464,871
Int. Cl.² C08L 9/02, 9/06
U.S. Cl. 260—880 B **16 Claims**

1. In a process for preparing a multiblock copolymer of two or more monomers, the steps of preparing said copolymer in a continuous system comprising (1) alternately feeding into a highly agitated polymerization system a first monomer stream, and then a second monomer stream, differing in monomer composition from the first monomer stream, each monomer stream being interrupted while the other monomer stream is flowed, and repeating continually the feeding of said alternating streams, (2) adding to the polymerization system an anionic polymerization catalyst capable of polymerizing each of said monomers, the rate of addition of said catalyst being controlled to give the desired molecular weight to the resultant multiblock copolymer, (3) withdrawing from said polymerization system a product stream at the same rate as the total of the said feed streams whereby there is substantially continual flow through said polymerization system.

3,937,761
SYMMETRICAL BIS(UNSYMMETRICAL TERTIARY-ALKYL AND TERTIARY- ARALKYL AZO) COMPOUNDS

Ronald Edward Mac Leay, Williamsville, and Chester Stephen Sheppard, Tonawanda, both of N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 88,247, Nov. 9, 1970, which is a continuation-in-part of Ser. No. 725,180, April 29, 1968, abandoned, which is a continuation of Ser. No. 616,158, Feb. 15, 1967, abandoned, which is a continuation of Ser. No. 409,306, Nov. 5, 1964, abandoned. This application Dec. 26, 1973, Ser. No. 428,494
Int. Cl.² C08L 31/02, 25/08; C09B 31/02, 29/22
U.S. Cl. 260—885 **11 Claims**

1. The process for preparing a polymer by free radical initiation, the improvement which comprises polymerizing at least one monomer containing ethylenic unsaturation in the presence of a bis-azo compound having the formula:

$$R{-}N{=}N{-}R_{13}{-}N{=}N{-}R'' \qquad (I)$$

wherein

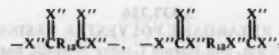
R equals R′ equals $(R'')_3C$;

$(R'')_3C$ is C_4–C_{20} t-alkyl, cycloalkyl, alkylcycloalkyl, arylcycloalkyl or aralkyl wherein R″ is C_1–C_8 alkyl, C_7–C_{12} aralkyl or C_6–C_{14} aryl, not more than one R′ being aromatic, and two or three of said R″s can join with the tertiary carbon atom to form a cyclo-, bicyclo- or tricyclo-hydrocarbon radical of 3–12 carbons;

R_{13} is

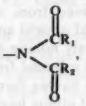
R_1 and R_2 are C_1–C_8 alkyl, C_3–C_{12} cyclo-, bicyclo- or tricycloalkyl, C_7–C_{12} aralkyl, or 5–6 membered heterocyclic wherein the hetero atom is O or N, R_1 and R_2 taken together can form a C_3–C_{11} alkylene diradical, one or more of each of the R_1s and R_2s can be substituted with lower alkoxy, hydroxy, carboxy, lower alkoxycarbonyl, lower alkylcarbonyloxy, halo, cyano, dimethylamido or lower alkylsulfonato radicals, and R_1 can also be C_6–C_{14} aryl;

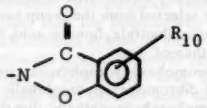
Y″ is —NHNH—, —S—, —O—, —SS—,



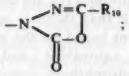
or —X″R_{13}X″—;

Z is —CN, —Cl, —Br, —X″R_5, —N_3, —SCN, —NCS, —OCN, —OOR, —OOH, —OH, —R_5, —NO_2, —NO_3, —C(CR)$_{10}$, —C(=O)NH_2, —C(=O)OR_6, —C(=NH)NH_2, —C(=NH)OR_6, —OC(=O)H, —X″C(=X″)X″R_5, —X″C(=X″)R_5, —OOC(=O)R_5,





or



R'_{13} is a C_2–C_{20} symmetrical diradical selected from alkyl, alkylaralkyl or alkylcycloalkylalkyl groups optionally containing two or more non-adjacent oxygen, sulfur or nitrogen atoms in the backbone structure, cycloalkyl or, when R_1 is not phenyl or substituted phenyl, from C_6–C_{12} hydrocarbon aromatic;

R_{13} is a symmetrical C_3–C_{15} alkyl-cycloalkyl, C_2–C_{10} alkylene, C_3–C_{12} cycloalkylene, C_6–C_{12} hydrocarbon aryl or C_8–C_{15} alkyl-aryl diradical;

X″ is oxygen or sulfur;

R_5 is C_1–C_{10} alkyl or cycloalkyl or C_6–C_{12} hydrocarbon aromatic;

R_6 is lower alkyl; and

R_{10} is hydrogen, C_1–C_{10} alkyl or cycloalkyl or C_6–C_{12} hydrocarbon aryl.

3,937,762
HEAT SEALABLE THERMOPLASTIC FILM FORMING COMPOSITIONS

A. Michael Nahmias, Canandaigua, and Edward M. Bullard, Brighton, both of N.Y., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 351,211, April 16, 1973, Pat. No. 3,865,905. This application June 7, 1974, Ser. No. 477,234. The portion of the term of this patent subsequent to Feb. 11, 1992, has been disclaimed.
Int. Cl.² C08L 23/16, 47/00
U.S. Cl. 260—889 **16 Claims**

1. A resinous blend composition comprising a blend of an essentially isotactic crystalline ethylene-propylene copolymer containing a minor amount sufficient to improve the heat sealability of film prepared therefrom of from about 5% to about 40% by weight of a normal solid, resinous, random multipolymer of a mixture comprising pentadiene 1,3 and at least one other compound containing ethylenic unsaturation copolymerizable therewith.

3,937,763

OLEFINIC COPOLYMER COMPOSITIONS

Masatoshi Ogura, and Keisaku Yamamoto, both of Ichihara, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

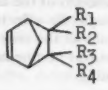
Continuation-in-part of Ser. No. 335,774, Feb. 26, 1973, Pat. No. 3,876,595. This application Jan. 28, 1975, Ser. No. 544,686

Claims priority, application Japan, Feb. 28, 1972, 47-20354

Int. Cl.[2] C08L 9/00, 23/00; C08F 210/00, 212/00

U.S. Cl. 260—889 24 Claims

1. A composition comprising 90 to 20 % by weight of at least one diene rubber or butyl rubber and 10 to 80 % by weight of a halogen-containing, sulfur-curable, normally amorphous quadripolymer obtained by contacting a mixture comprising (1) ethylene, (2) an α-olefin of the formula R—CH=CH$_2$ wherein R is a hydrocarbon radical having 1 to 20 carbon atoms, (3) a hydrocarbon compound having a plurality of non-conjugated unsaturated bonds capable of polymerizing with a coordinated catalyst, and (4) a halogenated norbornene compound represented by the formula,



wherein R_1, R_2, R_3 and R_4 are hydrogen atoms, hydrocarbon radicals having 1 to 20 carbon atoms, halogen atoms, or halogenated hydrocarbon radicals having 1 to 20 carbon atoms and containing at least one halogen atom as substituent, provided that R_1, R_2, R_3 and R_4 have as a whole at least one halogen atom, with a coordinated catalyst comprising an organoaluminum compound of the formula, AlR'_nX_{3-n} wherein R' is a hydrocarbon radical having 1 to 20 carbon atoms; X is a halogen atom; and n is any number of from 1.5 to 3 and a transition metal compound selected from the group consisting of vanadium compounds and titanium compounds, the molar ratio of said organoaluminum compound to said transition metal compound being from 5 : 1 to 0.5 : 1.

3,937,764

POLYMER ELECTROLYTES

Hideichi Horikawa; Shitomi Katayama; Hajime Serita, all of Akita, and Noboru Masuda, Kawaguchi, all of Japan, assignors to Denki Onkyo Co., Ltd., Tokyo, Japan

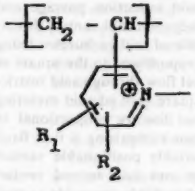
Continuation-in-part of Ser. No. 160,541, July 7, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 314,033

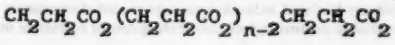
Claims priority, application Japan, July 9, 1970, 45-60084

Int. Cl.[2] C08L 39/04

U.S. Cl. 260—895 18 Claims

1. An electrolyte polymer having an inherent viscosity of from about 0.2 to about 5 at a concentration of 0.5 g./100 ml. methanol at 30°C; at least 10 mole percent of said polymer being polymerized vinylpyridine units having grafted upon the nitrogen thereof poly-β-propiolactone; and wherein said grafted vinyl pyridine unit is of the structural formula:





wherein R_1 and R_2 are hydrogen, methyl or ethyl and n has an average value greater than about 0.2 and less than that producing an X-ray crystalline pattern of poly-β-propiolactone homopolymer.

3,937,765

PROCESS FOR PREPARING O,O-DIARYL N,N-DIALKYL PHOSPHORAMIDATES

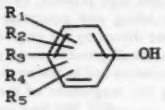
Arthur D. F. Toy, Stamford, Conn., and Kenneth L. Eilers, Irvington, N.Y., assignors to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 12, 1970, Ser. No. 80,195

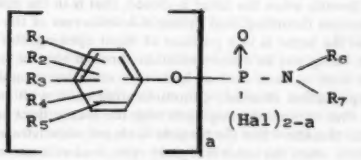
Int. Cl.[2] C07F 9/24; D06C 27/00

U.S. Cl. 260—973 10 Claims

1. A method for preparing O,O-diaryl N,N-dialkyl phosphoramidates which comprises reacting a phenol of the formula:



wherein R_1-R_5 independently represent hydrogen, C_1-C_4 alkyl and hydroxy alkyl, chlorine or bromine with an N,N-dialkyl phosphoamidic halide of the formula:



wherein R_6 and R_7 represent the same or different C_1-C_4 alkyl radicals, R_1-R_5 are as defined hereinbefore, a is a number equal to 1 or 0 and Hal is a halogen of chlorine or bromine; said reaction being conducted in the presence of an alkali metal or an alkaline earth metal hydroxide in an amount at least stoichiometrically equivalent to the phenol, said hydroxide being used in concentrations of from 50 to 100% by weight, the remainder being composed of water; and a substantially water-insoluble, water-immiscible, non-hydroxylic, polar ketone which is a solvent for said phenol, said halide and phosphoramidate; said ketone being selected from the group consisting of ketones defined by the formula:

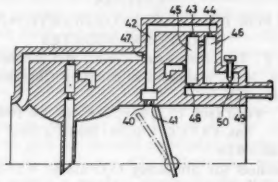
wherein R_x represents a C_1-C_4 alkyl group and R_y represents a C_3-C_8 alkyl and alicyclic ketones of the formula:

wherein n is an integer of 4 or 5 and the lower alkyl substituted derivatives thereof; the total number of carbon atoms of said ketone not exceeding 10.

3,937,766
MIXTURE CARBURATION DEVICE FOR THE OPERATION IN IDLING CONDITIONS IN PROGRESSION OF AN INTERNAL COMBUSTION ENGINE

Giampaolo Garcea; Gennaro Police, and Angelo Ciccarone, all of Milan, Italy, assignors to Alpha Romeo S.p.A., Milan, Italy

Filed Mar. 4, 1974, Ser. No. 447,770
Claims priority, application Italy, Mar. 5, 1973, 21183/73
Int. Cl.² F02M *3/08*
U.S. Cl. 261—41 D **8 Claims**



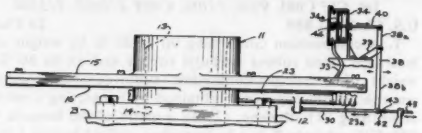
1. A carburettor for an internal combustion engine, more particularly for a motor vehicle, said carburettor being of the kind essentially formed by at least a principal system for metering and forming the mixture drawn by the engine during its operation at fair and high powers, by at least an additional system called for idling and progression for metering and forming the mixture drawn by the engine during its operation at no power and at small powers, and by at least one throttle for throttling the mixture fed to the engine, the position of the throttle governing the magnitude of the power delivered by the engine when operating, the improvement wherein said carburettor is characterized in that said idling and progression system is essentially formed by at least one emulsion chamber and a compensation chamber, said at least one emulsion chamber and said compensation chamber communicating each by means of a calibrated hole with a duct which in turn communicates with the intake duct of the engine upstream of the throttle, at least one hole being provided in the feed duct in the vicinity of the throttle edge so as to arrive upstream of the throttle when the latter is closed, that is in the position of maximum throttling, and to come downstream of the throttle when the latter is in a position of slight opening, the feeding duct being put in communication through said at least one hole with a duct, said at least one emulsion chamber and compensation chamber communicating each with said duct and thus communicating each with the intake duct upstream of the throttle when the throttle is closed, downstream of the throttle when the latter is slightly open, said at least one emulsion chamber being in communication with the intake duct in the area downstream of the throttle through a respective calibrated hole and being further in communication with the float chamber through a calibrated hole, whereas said compensation chamber is in communication with the intake duct in the area downstream of the throttle through an adjustable section port, said at least one emulsion chamber being also in communication with said compensation chamber through a respective calibrated hole.

3,937,767
CARBURETOR

Donald L. Chapman, 191 Osceola Ave., Tallmadge, Ohio 44278

Continuation-in-part of Ser. No. 298,187, Oct. 16, 1972, Pat. No. 3,855,366. This application Oct. 1, 1974, Ser. No. 510,936
Int. Cl.² F02M *1/08*
U.S. Cl. 261—41 B **4 Claims**

1. A carburetor, as for a gasoline engine, comprising, a housing having connecting air-intake and gas-mixing chambers; a slide-valve member, adjustably mounted between said chambers, and having a venturi-aperture means of variable flow area therethrough, for passage of air from said air-intake chamber to said gas-mixing chamber with correspondingly varying venturi effect on said air; means for adjusting said slide-valve member to vary the flow area of said venturi-aperture means; and a gas metering device presented within said gas-mixing chamber, for supplying gas to said gas-mixing chamber for convergence with air passed through said venturi-aperture means, said slide-valve member including vacuum

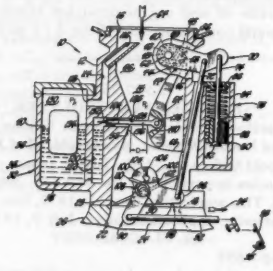


aperture means communicating with said venturi-aperture means; and accelerator speed-control means operable by variations in vacuum effect in said vacuum aperture means to adjust the size of the venturi opening, with resultant proportional automatic adjustment of the amount of gas being mixed with air passing through the effective venturi opening, said vacuum aperture means in the slide-valve member including a series of spaced passages communicating with said effective venturi aperture opening.

3,937,768
VARIABLE VENTURI CARBURETOR

Kenneth C. Bier, Bloomfield Hills; Kalin S. Johnson, Northville, and Ronald E. Herman, Romeo, all of Mich., assignors to Colt Industries Operating Corporation, New York, N.Y.

Continuation of Ser. No. 347,187, April 2, 1973, abandoned. This application Feb. 27, 1975, Ser. No. 553,457
Int. Cl.² F02M *9/14*
U.S. Cl. 261—44 R **9 Claims**



1. A carburetor for an internal combustion engine, comprising carburetor body means, induction passage means formed through said body means, a related source of fuel, variable venturi means situated in said induction passage means for variably determining a variably openable venturi throat, a fuel passage means comprising metering restriction means between said source of fuel and said induction passage and discharging fuel into said passage adjacent said venturi throat, the dominant metering characteristic of said carburetor being venturi depression at said throat proportional to the square of the airflow through said throat, fuel flow through said restriction means proportional to the square root of said metering depression, resulting in fuel flow directly proportional to airflow, said variable venturi means comprising a first fixed venturi section and a second variably positionable venturi section, said first venturi section and said second venturi section cooperating to define said variably openable venturi throat therebetween, variably positional throttle valve means situated in said induction passage means downstream of said variable venturi means, connecting means operative intercon-

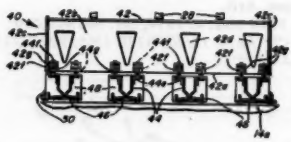
necting said throttle valve means and said second variably positionable venturi section for causing said second venturi section to assume opening positions determined by the position of said throttle valve means and correspondingly determine the effective opening of said variably openable venturi throat over the entire range of throttle movements from closed throttle to wide open throttle, said restriction means comprising calibrated orifice metering means and calibrated valve metering means, said calibrated orifice metering means and said calibrated valve metering means being relatively movable with respect to each other in order to thereby cooperatively define an effective fuel metering area, and one of said calibrated metering means being directly positioned by said second variably positionable venturi section and not any portion of said connecting means in order to thereby assure said effective fuel metering area to be totally dependent upon the actual position of said second variably positionable venturi section and thereby assure said effective fuel metering area to be correct for the then existing effective opening of said variably openable venturi throat, said connecting means comprising first and second lost motion means, said first lost motion means enabling said throttle valve means to at times move in the throttle opening direction without absolutely causing a corresponding movement of said second venturi section, and said second lost motion means enabling said second venturi section to move toward a further reduced venturi throat opening after said throttle valve means has attained a curb idle position.

3,937,769

LIQUID DISTRIBUTOR

Ralph F. Strigle, Jr., Akron, and Frank D. Moore, Tallmadge, both of Ohio, assignors to Norton Company, Worcester, Mass.

Filed Dec. 27, 1973, Ser. No. 428,886
Int. Cl.² B01F *3/04*
U.S. Cl. 261—97 **2 Claims**



1. A liquid distributor for use in a liquid/gas contact tower having

liquid feed splitter means for receiving a source of liquid feed and dividing the liquid feed into a plurality of liquid streams and

a plurality of troughs including apertures in opposite sidewalls thereof disposed beneath and extending transversely outward from the splitter means, across a chamber of predetermined cross sectional area to support means adjoining an inner wall of the contact tower, for receiving the liquid streams and further dividing the liquid feed into a greater number of streams, wherein the improvement comprises:

a pan disposed beneath each of the troughs for collecting, the liquid streams flowing from the trough and further dividing the liquid flowing into the pan and each pan having

a central ridge,

a pair of inclined bottom walls diverging outwardly and downwardly from the central ridge to opposite lower sides,

a pair of short sidewalls extending upwardly from a junction with the inclined bottom walls at the opposite lower sides, and

a plurality of drain openings located solely in each of the short sidewalls of the pan of greater number than the apertures in each sidewall of the trough and each of the drain openings having

a configuration defined by and situated within diverging sides extending upwardly from a bottom point of convergence located at least at the junction of the short sidewall with the inclined bottom wall and out of alignment with the apertures in an adjacent sidewall of the trough and there being at least three drain openings in the short sidewalls of the pans for each square foot of cross sectional area of the chamber;

converging walls, on each of the troughs, extending downwardly from the opposite sides to and converging at a lower central portion situated above and substantially opposite the central ridge of the pan beneath the trough, and wherein each of the apertures in the opposite sidewalls of the trough have a configuration defined by and located within diverging sides extending upwardly from a bottom point adjacent the lower central portion to a top side extending between the diverging sides; and means at opposite ends of the troughs and the pans for closing off and preventing the liquid from draining therefrom;

whereby a relatively low rate of liquid feed supplied to the distributor is divided by the apertures in the troughs, and thereafter further divided and uniformly distributed over the cross sectional area of the chamber by flowing down the inclined bottom wall and out of the bottoms of the drain openings at the junction without substantially increasing the level of the liquid in the pan.

3,937,770

METHOD FOR THE PRODUCTION OF MEALY CRUDE BLACK POWDER WHICH CAN BE FURTHER PROCESSED

Wolfgang Wiedemann, Dulmen, and Friedrich Platte, Recklinghausen, both of Germany, assignors to Wasagchemie GmbH, Munich, Germany

Filed Oct. 3, 1973, Ser. No. 403,200
Claims priority, application Germany, Oct. 17, 1972, 2250823
Int. Cl.² C06B *21/00*
U.S. Cl. 264—3 C **8 Claims**

1. A method for the production of mealy crude black powder from components consisting essentially of potassium nitrate, sulfur and carbon all in particle form comprising the steps of placing each component in a storage container, continuously withdrawing said components individually from said storage containers in the determined proportions, continuously feeding said separate components as particles into a circular oscillating cylindrical grinding zone consisting of at least two grinding zones rigidly interconnected and containing grinding elements, whereby said component particles are ground and mixed with each other with agglomeration of the individual component particles, and continuously withdrawing said mealy crude black powder.

3,937,771

PROCESS FOR PREPARING MODIFIED BLACK POWDER PELLETS

H. William Voigt, Jr., Stanhope; Lawrence W. Pell, West Orange, and Jean P. Picard, Morristown, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 21, 1974, Ser. No. 499,248
Int. Cl.² C60B *21/02*
U.S. Cl. 264—3 E **10 Claims**

1. A process for preparing black powder pellets consisting essentially of potassium nitrate, sulfur and carbon, which comprises:

dissolving the potassium nitrate in water,

mixing the aqueous potassium nitrate solution with an alcoholic precipitating medium, the aqueous potassium nitrate solution and the alcoholic medium being such that the potassium nitrate is essentially insoluble in the resulting mixture and precipitates therefrom in particulate form,

incorporating in the aqueous potassium nitrate solution or the alcoholic medium prior to the mixing step, the sulfur having an average particle size not greater than about 10 microns, the carbon selected from the group consisting of wood charcoal having an average particle size not greater than about 50 microns in longest dimension, and carbon black having an average particle size not exceeding about 100 millimicrons and a surface area not less than about 20 square meters per gram, and mixtures thereof, and a small amount of a polyvinyl pyrrolidone,

separating the resulting particulate mixture of potassium nitrate, sulfur and carbon containing polyvinyl pyrrolidone from said resulting mixture,

drying the particulate mixture, and

pressing the dry particulate black powder mixture into pellets.

3,937,772
PRODUCTION OF MIXTURES OF PLASTICS MATERIALS

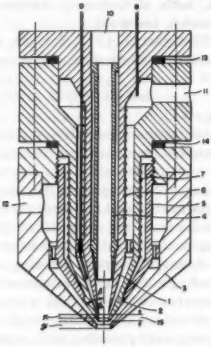
Friedrich Urban, Neuhofen; Oskar Buechner; Klaus Steigerwald, both of Ludwigshafen; Karl-Heinz Fauth, Frankenthal, and Heinz Gehrig, Buerstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 9, 1971, Ser. No. 151,392

Claims priority, application Germany, June 11, 1970, 2028751

Int. Cl.[2] B29B *1/02*

U.S. Cl. 264—12 **5 Claims**



1. A process for the production of a pulverulent homogeneous mixture of plastic material which comprises:

a. extruding a nonhomogeneous mixture of two or more plastic materials through a nozzle means,

1. at a temperature between the melting point of the plastic material having the lowest melting point of all components of the mixture and the maximum temperature which may be used without causing a chemical change therein,

2. at a nozzle speed of from 1 to 200 m/sec.,

3. in an annular flow which tapers to a cone angle of from 5° to 40° which has an annular gap width of from 0.2 to 3 mm and an angle of twist from 0° to 60° to form a molten tube having an internal diameter of from 1 to 30 mm and a wall thickness of from 0.2 to 3 mm;

b. exposing said extruded nonhomogeneous mixture of plastic materials to a gas or steam shearing medium which is divided into inner and outer streams to create a high shear velocity whereby a homogeneous mixture of plastic material is formed,

1. said inner stream of gas or steam shearing medium having a diameter of from 1 to 30 mm and an elevated temperature sufficient to maintain said extruded nonhomogeneous mixture of plastic material in a molten state, said inner stream being so directed that it impinges upon the inner surface of said extruded tube of said nonhomogeneous mixture for a distance of from 2 to 8 mm before reaching the inner edge of the orifice of said product nozzle means,

2. said outer stream of gas or steam shearing medium, flowing in an annular space which tapers to a cone angle of from 15° to 70° and having an annular gap width of from 0.3 to 5 mm at an elevated temperature sufficient to maintain said extruded nonhomogeneous mixture in a molten state so that said outer stream being so directed that it impinges upon the outer surface of said extruded tube for a distance of from 1 to 6 mm before exiting from said nozzle means, the volume of said outer stream to said inner stream being 1.2:1;

c. said extruded nonhomogeneous mixture of plastic materials being subject to high shear velocities of from 10^4 to 10^8 sec^{-1} for from 10^{-4} to 10^{-6} seconds by said inner and outer streams; and

d. spraying the resultant pulverulent homogeneous mixture of plastic material and gas or steam shearing medium from the nozzle means into a cooling and collecting means.

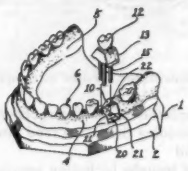
3,937,773
METHOD OF CONSTRUCTING DENTAL MODELS USING GUIDE PINS AND APERTURED RETAINER

Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.

Filed Mar. 4, 1974, Ser. No. 448,070

Int. Cl.[2] A61C *13/00*; B28B *1/08*; B32B *31/18*

U.S. Cl. 264—17 **3 Claims**



1. A method for forming a dental model with cast teeth which are selectively detachable and replaceable, the model being formed from a negative impression of a plurality of teeth, which negative impression includes buccal and lingual walls and wherein an uncured casting stone is poured into the negative impression to a depth sufficient to include margins, the teeth being removable and insertable while maintaining their alignment, said method comprising the steps of:

a. using a retainer having a plurality of parallel transversely oriented cylindrical cavities and of a length and configuration commensurate with the type and number of cast teeth to be removed from and inserted into the dental model;

b. removably inserting the body of each of a plurality of non-tapered guide pins into a mating one of the cylindrical cavities extending through the retainer, each of the guide pins having a perturbation disposed at one end thereof;

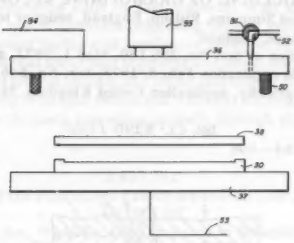
c. positioning the guide pins within the retainer to maintain the perturbed end of each of the guide pins external to the retainer;
d. locating the retainer adjacent the uncured casting stone to fully immerse the perturbed ends of the guide pins within the casting stone;
e. compacting the casting stone to fill any voids within the negative impression and to remove any air bubbles;
f. curing the casting stone to form a rigid composite assembly of casting stone and the perturbed ends of the guide pins, which assembly terminates at a nearer surface of the retainer; and
g. making mesial and distal cuts through the cured casting stone only to the surface of the retainer from which the perturbed ends of the guide pins extend to segregate a section of casting stone defining at least one cast tooth and having at least the perturbed end of one guide pin lodged therein but leaving the retainer intact; whereby, the guide pin or guide pins extending from the section and being non-tapered and slidably retained within the cylindrical cavities of the retainer prevent wobble and tilting of the section during removal and reinsertion thereof.

3,937,774

FLOW MOLDING MEANS AND METHOD

Paul J. Wiley, Lexington, and Robert Davis, Concord, both of Mass., assignors to Allied Resin Corporation, Weymouth, Mass.

Continuation-in-part of Ser. No. 308,830, Nov. 22, 1972, abandoned. This application Oct. 31, 1973, Ser. No. 407,716
Int. Cl.[2] B29C *1/02, 17/00;* **H05B** *9/00*
U.S. Cl. 264—26 **8 Claims**



7. In a method of flow molding wherein a mold and sheet to be flow molded are positioned between a pair of platens and the platens are brought together to mold said sheet with a surface configuration, the improvement comprising,
said mold comprising a mold body, a mold base and a mold outer surface carrying means for transferring a surface configuration to said sheet to be molded, said mold body being formed of a rigid thermosetting plastic material and having an electrically conductive layer forming a continuous conductive path from said base to said means, said path being formed by a plurality of finely divided, uniformly dispersed, metal surfaced particles with the metal selected from the group consisting of gold, silver and platinum and said conductive layer having a volume resistivity of from 1×10^{-3} to 1×10^{-5} ohms-cm at 20°C.

3,937,775

PROCESS FOR PRODUCTION OF CARBON PRODUCTS

Shozo Horikiri, Amagasaki; Jiro Iseki, Toyonaka; Masao Minobe, Ibaraki, and Chikanao Kawai, Amagasaki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Filed Oct. 18, 1973, Ser. No. 407,509
Claims priority, application Japan, Oct. 23, 1972, 47-106445
Int. Cl.[2] B29C *25/00*
U.S. Cl. 264—29 **18 Claims**

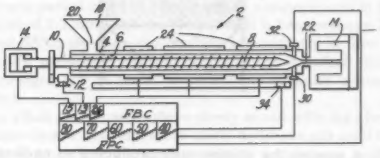
1. A process for producing carbon micro-balloons which comprises reacting micro-particles made from at least one polymer selected from the group consisting of an alkyl vinyl polymer, an aryl vinyl polymer, a vinyl ether polymer, a polyacrylic ester, a polyvinyl nitrile, an alkyl vinylidene polymer, an aryl vinylidene polymer, a cyanovinylidene polymer, polybutadiene, polyisoprene and polychloroprene with sufficient sulfuric anhydride or chlorosulfonic acid at a temperature of 0°C. to 400°C. so as to render the surface layer of said micro-particles infusible while the inner part of the micro-particles is maintained without being so modified, and carbonizing the resulting modified micro-particles by heating at a temperature above the decomposition point of the starting polymer, said temperature being at least in the range of 500°C. to 1,500°C.

3,937,776

METHOD FOR CONTROLLING INJECTION MOLDING MACHINES

Peter Hold; Angelo J. Notte, both of Milford, and Marc A. Rizzi, Orange, all of Conn., assignors to USM Corporation, Boston, Mass.

Continuation of Ser. No. 194,280, Nov. 1, 1971, abandoned. This application Jan. 21, 1974, Ser. No. 435,348
Int. Cl.[2] B29F *1/06*
U.S. Cl. 264—40 **8 Claims**



1. A method for controlling the parameters of an injection molding process, said molding process including; sequence of steps feeding material into a plasticating chamber, applying, by the use of heaters, a predetermined amount of heat to the chamber, rotating a plasticating screw located in the chamber at a predetermined speed to plasticate the material, slidably retracting the screw during plastication, under a predetermined back pressure, to a charged position to collect a quantity of plasticated material ahead of the screw, and injecting the material into a mold by a forward sliding thrust of the screw, the forward sliding thrust of the screw stopping at a predetermined standard position said control method comprising:
A. detecting the sliding speed of the screw during injection;
B. detecting the temperature of the plasticated material;
C. detecting the position of the screw during injection:
D. comparing the detected screw position with the predetermined standard position when the sliding speed of the screw is reduced substantially to zero;
E. adjusting the charged position of the screw to compensate for any difference in the detected screw position and the standard position for subsequent injection cycles;
F. comparing the detected temperature of the plasticated material with a predetermined standard temperature; and
G. adjusting the supply of heat energy to the plasticating chamber to compensate for any difference in the temper-

ature of the plasticated material and the standard temperature for subsequent injection cycles by selectively adjusting rotational screw speed, back pressure, and the heat applied by the chamber heaters according to a priority sequence which maximizes the input of mechanical energy.

3,937,777

PROCESS FOR THE PRODUCTION OF SHEETS OF FOAMED THERMOPLASTICS SYNTHETIC RESINS

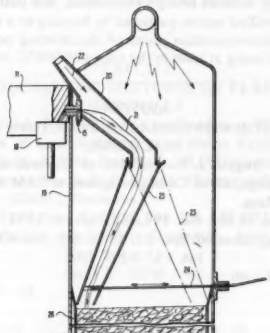
Michael Wienand, Siegburg; Jürgen Hasberg, Troisdorf-Oberlar, and Franz-Werner Alfter, Siegburg, all of Germany, assignors to Dynamit Nobel AG, Germany

Filed Nov. 27, 1972, Ser. No. 309,914

Claims priority, application Germany, Nov. 26, 1971, 2158673

Int. Cl. B29d 27/00

U.S. Cl. 264—53 27 Claims



1. A process for continuously producing an endless sheet product of a foamed thermoplastic synthetic resin comprising feeding a thermoplastic synthetic resin into an extruder, introducing at least about 35% based on the volume of the resultant admixture of a low-boiling volatile organic liquid expanding agent into the synthetic resin in said extruder under high pressure, said liquid expanding agent being capable of dissolving the thermoplastic resin at temperatures above 100°C and under pressures greater than one atmosphere, admixing the resin and expanding agent to provide a fluid admixture, heating said fluid admixture to a temperature substantially above the boiling point of the liquid expanding agent under normal pressure and subjecting the fluid admixture to high pressures, extruding the admixture through a die of the screw extruder having a plurality of small extrusion nozzles whereby the admixture suddenly expands and forms a plurality of filaments of synthetic resin foam, aligning the foam filaments exiting from the nozzles by an air stream, placing the foam filaments into an oscillating motion, loosely layering the oscillating foam filaments into a continuous web on a sieve-like conveyor belt traveling offset by about 90° with respect to the oscillating motion of the foam filaments, continuously pressing the thus-layered web of synthetic resin foam into a crude sheet between two sieve-like conveyor belts, tempering the crude sheet so formed by passing hot air therethrough whereby substantial removal of the expanding agent is effected, and thereafter forming said crude sheet into said endless sheet product.

3,937,778

METHOD OF VACUUM-PRESSURE INJECTION MOULDING

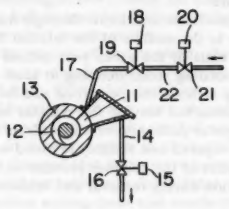
Shoichi Tanaka, Shizuoka, Japan, assignor to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 24, 1974, Ser. No. 517,799

Claims priority, application Japan, Oct. 27, 1973, 48-120997

Int. Cl.² B29D 09/04, 29/00

U.S. Cl. 264—102 2 Claims



1. In a method of injection moulding of the type utilizing an injection moulding machine including a heated cylinder having a vent opening at an intermediate point between the opposite ends thereof and a screw rotatably contained in the cylinder and wherein the screw is rotated during metering but stopped during injection, the improvement which comprises the steps of maintaining a reduced pressure in said vent opening during the rotation of said screw, and introducing into said vent opening a predetermined quantity of vaporizable liquid at the same time when the rotation of said screw is stopped thus causing said liquid to evaporate to increase the pressure in said vent opening.

3,937,779

MOULDING OF GRAMOPHONE RECORDS

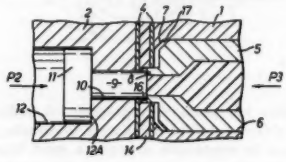
John Ernest Simmons, Ruislip, England, assignor to EMI Limited, Hayes, England

Continuation of Ser. No. 356,180, May 1, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,760

Claims priority, application United Kingdom, May 3, 1972, 20513/72

Int. Cl.² B29D 17/00

U.S. Cl. 264—106 4 Claims



1. A method of moulding a gramophone record including the steps of introducing mouldable material into a mould cavity between first and second mould parts through a nozzle tip which also acts as a hole-forming member and forming an aperture in the record during the formation of the record in said mould cavity by causing said first and second co-operable hole-forming members in respective mould parts to press into contact at a position within the thickness of the record, thereby to form the hole, subsequently moving one of said hole-forming members beyond said position to sever any thin web remaining at said nozzle tip, and thereafter opening the mould cavity and removing the apertured record therefrom.

3,937,780

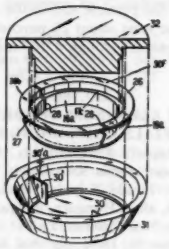
METHOD OF MOLDING A PRESSURE VESSEL LOCKING RING WITH SPLIT RIGID REINFORCING SEGMENTS

Jacques H. Mercier, 49 rue de Naples, Paris, France

Division of Ser. Nos. 613,660, Feb. 2, 1967, Pat. No. 3,537,481, and Ser. No. 822,445, May 7, 1969, Pat. No. 3,640,172, and Ser. No. 188,955, Oct. 13, 1971, Pat. No. 3,733,682, and Ser. No. 336,840, Feb. 28, 1973, Pat. No. 3,827,133. This application May 3, 1974, Ser. No. 466,876

Int. Cl.² B29B 5/00; B29D 3/00; B29H 9/10

U.S. Cl. 264—274 1 Claim



1. The method of forming a locking member having a molded ring of resilient material, said ring having one portion uninterrupted and another portion having an annular recess therein, said ring being secured to plural arcuate rigid segments having adjacent spaced ends, said segments each having undercut configured portions complementary to said recess and adapted to coact therewith to securely retain said arcuate segments to said ring, comprising, disposing said segments in a mold cavity with said configured portions remote from mold surfaces, separating ends of said segments with spacer elements, said spacer elements projecting beyond said segments on sides thereof having said configured portions, and molding resilient material about said segments and about said undercut configured portions thereof and about said spacer elements to form said ring with said recess and with slits corresponding to said spacer elements extending partially through said ring.

3,937,781

METHOD FOR FORMING FIBER-REINFORCED PLASTIC ARTICLES

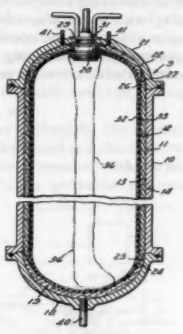
Phillip E. Allen, Wickliffe, Ohio, assignor to Structural Fibers, Inc., Chardon, Ohio

Continuation of Ser. No. 145,237, May 20, 1971, abandoned. This application June 15, 1973, Ser. No. 370,460

Int. Cl.² B29C 17/06; B32B 17/04

U.S. Cl. 264—314 7 Claims

1. A method of making hollow-reinforced resin articles of accurate wall thickness comprising positioning a hollow lay-up of loosely felted reinforcing fibers against the inner surface of a rigid mold having a cylindrical wall portion and domed end portions, venting said mold, providing in said mold an amount of uncured resin required to form said article, compressing said lay-up with an internally pressurized inflatable core, while confining only a cylindrical portion of the inflatable core with a substantially inextensible sleeve, inflating said inflatable core to a first pressure sufficient to fully expand said core against the interior of the sleeve until said fiber lay-up along said cylindrical portion is compressed to a desired state of compression, while maintaining said state of compression on said lay-up along said cylindrical portion increasing inflation of said core to a second pressure to further compress the portions of said lay-up along said domed ends in regions extending axially beyond said sleeve to a state of compression greater than that developed by said first pressure, curing said



resin, deflating said core, and removing said core from the mold.

3,937,782

PROCESS FOR THE PRODUCTION OF MONOSILANDIOL

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 262,485, June 14, 1972, which is a continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application Mar. 24, 1975, Ser. No. 561,084

Int. Cl.² C01B 33/00; C01D 5/02; C01B 13/00, 31/20

U.S. Cl. 423—325 8 Claims

1. The method of producing monosilandiol by the following steps:

a. a dry alkali metal metasilicate is added, with agitation over a period of 15 to 45 minutes to a mineral acid in the ratio of 1:2 mols, and the temperature is kept between 25° and 85°C; the chemical reaction is completed in 4 to 12 hours, producing silico-formic acid and an alkali metal hydrogen salt in the form of a white granular mixture; then

b. an alkali metal carbonate is slowly mixed with the above silico-formic acid and alkali metal hydrogen salt until the pH is from 8 to 12; carbon dioxide and oxygen evolve from the mixture, and the mixture forms a solid mass in about 1 to 2 hours, which contains monosilanal and an alkali metal salt; then

c. water is mixed with the above solid mass and the alkali metal salt is filtered off and the water reacts with monosilanal, thereby forming silandiol ($H_2Si(OH)_2$), a white granular compound.

3,937,783

RECOVERY OF FLUORINE, URANIUM AND RARE EARTH METAL VALUES FROM PHOSPHORIC ACID BY-PRODUCT BRINE RAFFINATE

Christian A. Wamser, Camillus, N.Y., and Charles P. Bruen, Bernardsville, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Feb. 21, 1974, Ser. No. 444,211

Int. Cl.² B01D 11/04; C01G 56/00

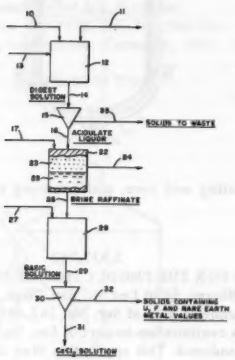
U.S. Cl. 423—8 9 Claims

1. A process for simultaneous recovery of fluorine, uranium and rare earth metal values from a tricalcium phosphate mineral containing same, which comprises:

a. contacting said mineral with hydrochloric acid to digest said mineral, thereby forming (1) a digest solution containing phosphoric acid, calcium chloride, fluorine, uranium and rare earth metal values and (2) an insoluble residue;

b. separating said insoluble residue from said digest solution;

c. contacting said separated digest solution with an organic solvent capable of dissolving phosphoric acid but having limited miscibility with water free of phosphoric acid, thereby forming an organic phase containing phosphoric acid and an aqueous phase containing calcium chloride and fluorine, uranium and rare earth metal values;



d. separating said organic phase from said aqueous phase;

e. admixing said separated aqueous phase with an amount of a basically reacting compound sufficient to effect a pH of at least about 9, thereby forming:

1. a basic solution containing calcium chloride and
2. precipitated solids containing fluorine, uranium and rare earth metal values; and

f. separating the precipitated solids containing fluorine, uranium and rare earth metal values from said basic solution.

3,937,784

METHOD FOR REMOVING FLUORIDE IONS FROM UO_2 POWDERS

Richard Beutner, Hanau, and Friedrich Plöger, Kleinostheim, both of Germany, assignors to RBG, Reaktorbrennelemente GmbH, Wolfgang, near Hanau, Germany

Continuation of Ser. No. 256,007, May 23, 1972, abandoned. This application Nov. 23, 1973, Ser. No. 418,731

Claims priority, application Germany, June 1, 1971, 2127107

Int. Cl. C01g *43/02, 56/00*

U.S. Cl. 423—19 **3 Claims**

1. A method of purification of a heavy metal oxide selected from uranium and plutonium oxides for use as a nuclear fuel contaminated with fluoride and hydrogen to produce a purified heavy metal oxide containing not more than 25 parts per million fluoride which comprises passing steam in contact with said contaminated heavy metal oxide to effect removal of substantially all the hydrogen and thereafter subjecting said heavy metal oxide to pyrohydrolysis in the absence of hydrogen by passing steam at a temperature above 650°C in contact with said heavy metal oxide from which hydrogen has been removed to effect reduction of the fluorine content in said contaminated heavy metal oxide to no more than 25 parts per million.

3,937,785

TREATMENT OF CHROMIUM ORE RESIDUES TO SUPPRESS POLLUTION

Alan Brian Gancy, Syracuse, and Christian Albert Wamser, Camillus, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,922

Int. Cl.² C01G *37/00, 37/14*

U.S. Cl. 423—53 **10 Claims**

1. The method for reducing bleeding of water-soluble chromium compounds from the solid residue obtained in the production of chromates from chromite ore by roasting the ore under alkaline oxidizing conditions to form water-soluble chromate, followed by extraction of the chromate, which comprises reducing the particle size of the solid residue prior to disposal so that at least about 20 percent by weight of the residue, dry basis, passes through a 200 mesh (U.S.) screen.

3,937,786

PRODUCTION OF ALUMINUM CHLORIDE FROM RAW MATERIALS CONTAINING COAL

Ernő Nemecz, Budapest; Aurél Újhidy, Veszprem; Károly Polinszky, Budapest; Janós Szépvölgyi, Veszprem; Oszkár Borlai, Budapest; László Kápolyi, Budapest, and Tamás Székely, Budapest, all of Hungary, assignors to Toth Aluminum Corporation, New Orleans, La.

Filed June 20, 1974, Ser. No. 481,543

Claims priority, application Hungary, June 28, 1973, 16126

Int. Cl.² C01F *7/56*

U.S. Cl. 423—136 **5 Claims**

1. A process for production of aluminum chloride consisting essentially the steps of: comminuting bituminous shale having an ash content of approximately 50% by weight and the aluminum content of the ash being at least 20%, calculated as Al_2O_3; calcining the bituminous shale to remove physically and chemically bound water and to cause coking; and chlorinating the calcined bituminous shale with a gaseous stream containing chlorine and carbon monoxide to form the aluminum chloride.

3,937,787

TREATMENT OF GASES CONTAINING SULFUR DIOXIDE

Everett Gorin; Metro D. Kulik, and Robert T. Struck, all of Pittsburgh, Pa., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. Nos. 222,760, Feb. 2, 1972, abandoned, and Ser. No. 309,869, Nov. 27, 1972, abandoned, and Ser. No. 347,261, April 2, 1973, abandoned. This application May 9, 1973, Ser. No. 358,786

Int. Cl.² C01B *17/00*

U.S. Cl. 423—242 **11 Claims**

1. In a regenerative process for the removal of SO_2 from an SO_2-containing gas stream which has (1) a scrubbing circuit containing a scrubbing zone through which a recirculating stream of aqueous sodium, potassium or ammonium carbonate solution continuously passes in intimate contact with said gas stream under sulfite-forming conditions to thereby convert the SO_2 in the gas stream to sulfite, and (2) a regeneration zone for regenerating said carbonate for reuse in said scrubbing zone, the improvement which comprises

a. maintaining in said recirculating aqueous solution, throughout its entire traverse around said scrubbing circuit, a thiosulfate having the same cation as said carbonate and in a concentration of at least 10 percent by weight of said recirculating solution;

regulating the amount of sulfite in said recirculating aqueous solution so that its concentration is always less than 5 percent by weight thereof;

c. converting the sulfite formed in said scrubbing zone to thiosulfate while in said scrubbing circuit, but in a sulfite-reduction zone separate from said scrubbing zone, by means of a sulfite-reducing agent;

d. withdrawing a minor portion of said recirculating aqueous solution from said scrubbing circuit to a regeneration zone wherein thiosulfate contained in said minor portion is converted by means of CO to a mixture of carbonate and said sulfite-reducing agent; and

e. returning an effluent aqueous stream containing in admixture said carbonate and said reducing agent to said scrubbing circuit.

3,937,788
TREATMENT OF GASES CONTAINING SULFUR DIOXIDE

Everett Gorim; Metro D. Kulik, and Robert T. Struck, all of Pittsburgh, Pa., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 222,760, Feb. 2, 1972, abandoned. This application Oct. 29, 1973, Ser. No. 410,722
Int. Cl.² C01B *17/00*
U.S. Cl. 423—242 **5 Claims**

1. A process for removing SO_2 from a gas containing the same which comprises

a. recirculating an aqueous absorbent through a circuit which includes a gas scrubbing zone and a thiosulfate generation zone outside of said scrubbing zone but still in said circuit;

b. introducing into said gas scrubbing zone a sulfite-forming additive selected from the class consisting of the hydroxides and carbonates of the alkali metals, the alkaline earth metals, and ammonia in approximately the amount required to convert the SO_2 in said SO_2-containing gas to sulfite;

c. maintaining in said recirculating aqueous absorbent a thiosulfate having the same cation as said sulfite-forming additive, the minimum concentration of said thiosulfate being 50 weight percent of the total sulfur-containing solutes in the aqueous absorbent as the latter leaves said scrubbing zone;

d. maintaining the pH of said recirculating aqueous absorbent in said scrubbing zone between 6 and 8;

e. passing said SO_2-containing gas through said gas scrubbing zone in contact with said recirculating aqueous absorbent, whereby an effluent gas stream containing a reduced amount of SO_2 results, and an effluent water stream containing sulfites and thiosulfate is produced;

f. reacting sulfites formed in step (e) with a sulfite-reducing agent in said thiosulfate generation zone which is maintained at a pH between 6 and 7.8 to convert said sulfites to the corresponding thiosulfate;

g. withdrawing a portion of said recirculating aqueous absorbent from said circuit;

h. subjecting said portion to reduction by a thiosulfate-reducing agent to produce fresh aqueous absorbent containing said sulfite-forming additive and said sulfite-reducing agent; and

i. returning said fresh aqueous absorbent to said thiosulfate generation zone.

3,937,789
PROCESS FOR THE NEUTRALIZATION OF ACID SOLUTIONS OF CAPROLACTAM

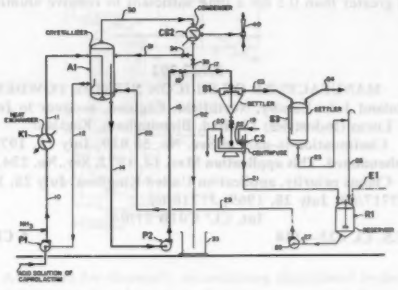
Ivo Donati; Rieti; Werner Muench, Milan, Switzerland, and Mario Fidecicchi, Torviscosa, all of Italy, assignors to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Milan, Italy

Continuation-in-part of Ser. No. 31,343, April 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 520,555, Jan. 14, 1966, abandoned. This application Dec. 14, 1973, Ser. No. 425,171
Claims priority, application Italy, Jan. 21, 1975, 1329/65
Int. Cl.² C01C *1/242*
U.S. Cl. 423—549 **5 Claims**

1. In a process for neutralizing a solution of ε caprolactam in sulfuric acid wherein neutralization is effected with ammonia, and the ammonium sulfate, formed as a result of the neutralization is subsequently recovered in the presence of water, the improvement comprising

feeding into a reaction vessel an aqueous solution of ε-caprolactam in sulfuric acid, and a quantity of liquid ammonia sufficient to neutralize all the sulfuric acid, holding this mixture, including the water which is present, in this same vessel under subatmospheric pressure sufficient to maintain said vessel at a temperature of about 40°C to 50°C, and

utilizing the heat evolved by the exothermic reaction between the sulfuric acid and the ammonia to effect in said same vessel, simultaneously with the neutralization of the sulfuric acid by the ammonia, evaporation of the water



present in said vessel, in an amount at least three-fourths the amount of sulfuric acid concurrently neutralized, and consequent crystallization in said vessel of the produced ammonium sulfate, so that substantial hydrolysis of the caprolactam is avoided while a substantial portion of the water present in the mixture is being evaporated and the ammonium sulfate is allowed to crystallize in said vessel substantially free from the caprolactam, and

drawing off the evaporated water from said same reaction vessel,

separating the caprolactam from the remaining mother liquor, and

separating the ammonium sulfate also from said mother liquor.

3,937,790
USE OF WATER AS A CATALYST FOR THE POLYMERIZATION OF CHLOROCYCLOPHOSPHAZENES

Harry Rex Allcock and Karen M. Smeltz, both of State College, Pa.; James Earl Gardner, deceased, late of State College, Pa. (by Patricia Gardner, executrix), assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Oct. 2, 1974, Ser. No. 511,400
Int. Cl.² C01B *25/00*
U.S. Cl. 423—300 **5 Claims**

1. In the polymerization of chlorocyclophosphazenes to produce a substantially linear $(NPCl_2)_n$ polymer product in which n is from about 16 to about 20,000, wherein hexachlorocyclotriphosphazene, octachlorocyclotetraphosphazene or mixtures of said hexa- and octachlorocyclophosphazenes are polymerized at temperatures between 200° and 300°C, the improvement which comprises conducting the polymerization in the presence of between 0.005 and 1.0 mol % of H_2O.

3,937,791

ALUMINA REMOVAL FROM CRYSTALLINE ALUMINOILICATES WITH CR(III) SOLUTIONS

William E. Garwood, Haddonfield; Nai Yeun Chen, Titusville, and Stanley J. Lucki, Runnemede, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 129,108, March 29, 1971, abandoned. This application Aug. 17, 1973, Ser. No. 389,109

Int. Cl.² C01B *33/28*; B01J *29/06*

U.S. Cl. 423—328 14 Claims

1. A method of removing alumina from a crystalline aluminosilicate having a silica/alumina mole ratio of from above 3 to about 12 which comprises heating said aluminosilicate to a temperature of greater than 50°C to about 100°C in the presence of positive trivalent chromium ions in aqueous solution of above 0.01 Normal of a chromium salt of a mineral acid whereby the pH is less than 3.5 such that the atomic ratio of chromium in the solution to aluminum in the aluminosilicate is greater than 0.5 for a time sufficient to remove alumina.

3,937,792

MANUFACTURE OF SILICON NITRIDE POWDER

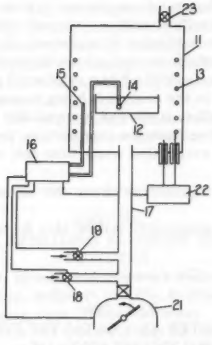
Roland John Lumby, Northfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Continuation-in-part of Ser. No. 55,019, July 15, 1970, abandoned. This application Mar. 14, 1972, Ser. No. 234,624

Claims priority, application United Kingdom, July 28, 1969, 37717/69; July 28, 1969, 37718/69

Int. Cl.² C01B *21/06*

U.S. Cl. 423—344 6 Claims



1. A method of manufacturing a silicon nitride powder comprising heating a bed containing silicon powder in a furnace having an atmosphere including nitrogen, sensing the temperature in the bed and comparing said temperature with a further temperature at another point in the furnace outside said bed, and controlling the partial pressure of the nitrogen in the furnace atmosphere in accordance with the difference between said temperatures so as to ensure that the temperature in the bed does not exceed a predetermined value above which β-phase silicon nitride is formed, the partial pressure of the nitrogen in the furnace being controlled by effecting at least one of the steps of:

a. diluting the nitrogen in the furnace atmosphere and,

b. evacuating the furnace.

3,937,793

PROCESS FOR THE CONTINUOUS MANUFACTURE OF CRYSTALLIZED AMMONIUM THIOSULFATE

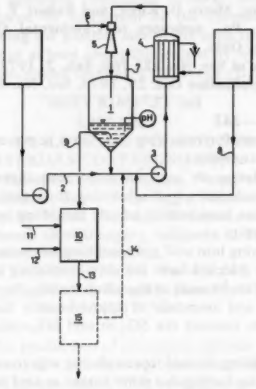
Adolf Metzger, Wiesbaden; Karl-Heinz Henke, Frankfurt am Main, and Horst Schreiber, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 18, 1973, Ser. No. 370,686

Claims priority, application Germany, June 20, 1972, 2230005

Int. Cl.² C01B *17/64*

U.S. Cl. 423—514 3 Claims



1. A process for the continuous manufacture of crystallized ammonium thiosulfate which comprises: reacting ammonia with oxygen containing sulfur dioxide in an ammonium thiosulfate solution to form ammonium bisulfite and ammonium sulfite at a pH of from 5.5 to 7.0 and a temperature of up to 80°C; and, in a second step, converting the ammonium bisulfite and ammonium sulfite in the solution formed with ammonia and sulfur to ammonium thiosulfate at a temperature of 105°C, said temperature being obtained by heating, if necessary.

3,937,794

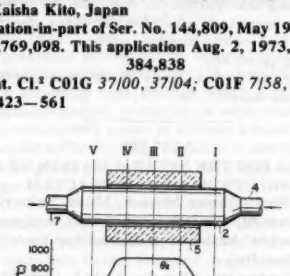
METHOD OF MANUFACTURING FINE POWDERS OF METAL SULFIDE

Norio Kanetake, Tokyo; Ikuo Maruyama, Kawasaki, and Katsuyuki Morita, Fujisawa, all of Japan, assignors to Kabushiki Kaisha Kito, Japan

Continuation-in-part of Ser. No. 144,809, May 19, 1972, Pat. No. 3,769,098. This application Aug. 2, 1973, Ser. No. 384,838

Int. Cl.² C01G *37/00*, *37/04*; C01F *7/58*, *7/70*

U.S. Cl. 423—561 4 Claims



1. The process of producing the sulfide of chromium or aluminum which comprises the steps of: placing a chromium or aluminum chloride or bromide occluded mass in the shape

of a porous hollow cylinder which does not contain carbon, moisture, hydroxyl ions or oxidizing agent in a closed heating chamber; heating said mass to at least the fusing point of said chromium or aluminum chloride or bromide; vaporizing the chromium or aluminum chloride or bromide produced thereby in a stream of a dried gaseous mixture supplied to said chamber at a low temperature, said low temperature being lower than the temperature at the point where the chromium or aluminum chloride or bromide occluded body is heated and lower than the fusing point of said bromide or chloride, and said gaseous mixture consisting of an inert gas and hydrogen sulfide gas, and thus directly reacting the vaporized chromium or aluminum chloride or bromide with the hydrogen sulfide component of said dried gaseous mixture whereby the corresponding metal sulfide is produced; and quenching and recovering the chromium or aluminum sulfide so produced in the form of a fine dry powder in the presence of the said inert gaseous component of the dried gaseous mixture.

3,937,795
DESULFURIZING PROCESS FOR HYDROGEN SULFIDE-CONTAINING GASES

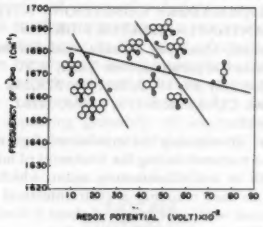
Nobuyasu Hasebe, No. 24-8, 2-chome, Nishiogi-kita, Suginami, Tokyo, Japan

Continuation-in-part of Ser. No. 210,249, Dec. 20, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 439,616

Claims priority, application Japan, Dec. 21, 1970, 45-114904

Int. Cl.[2] **C01B** *17/04;* **B01D** *53/34*

U.S. Cl. 423—573 G **9 Claims**



1. A process for the desulfurization of hydrogen sulfide-containing gases comprising mixing (A) a hydrogen sulfide oxidizing catalyst having a standard oxidation-reduction potential, Eo, in a range of from about 0.45 to 0.7 volt, and selected from the group consisting of quinones and hydroquinones having present therein at least one substituent selected from the group consisting of sulfonic and carboxylic acid groups and alkali and alkaline earth metal salts thereof, thioglycol, thiol, hydroxyl, lower alkyl and lower alkoxy groups with (B) a precursor of a chelating agent which is selected from the group consisting of the reaction product of a metal selected from the group consisting of the metals of groups V, VI, VII and VIII in the fourth period of the Periodic Table, arsenic and selenium with an acid selected from the group consisting of oxalic, citric, tartaric and glutaric acids; aging the mixture of (A) and (B) for from about 10 minutes to about 12 hours and forming a naphthoquino chelate compound, forming an absorption medium comprising said chelate compound, contacting a hydrogen sulfide-containing gas with said absorption medium, and absorbing the hydrogen sulfide from said gas, contacting the absorption medium with an oxidizer selected from the group consisting of air, oxygen and oxygen-containing gas, and converting said hydrogen sulfide to sulfur while regenerating said naphtho-quino chelate compound, recirculating the regenerated naptho-quino chelate compound for further use and recovering a substantially hydrogen sulfide-free gas.

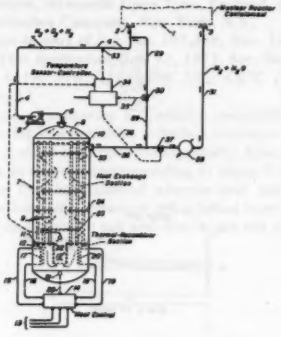
3,937,796
RECUPERATIVE THERMAL RECOMBINING SYSTEM FOR HANDLING LOSS OF COOLANT

Andrew Tej Bhan, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 308,354, Nov. 21, 1972, Pat. No. 3,853,482, which is a continuation-in-part of Ser. No. 216,714, Jan. 10, 1972, Pat. No. 3,791,923. This application Nov. 23, 1973, Ser. No. 418,697. The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.

Int. Cl.[2] **C01B** *5/00*

U.S. Cl. 423—580 **6 Claims**



1. A method for thermally recombining dissociated hydrogen and oxygen in a loss of coolant gaseous stream from a nuclear reactor containment which comprises:

a. passing the dissociated gaseous charge stream into admixture with a resulting high temperature water vapor containing combined gaseous stream obtained as hereinafter set forth,

b. subsequently passing the resulting higher temperature gaseous stream into a recombiner zone having a temperature therein sufficiently high to effectuate association with said dissociated gaseous charge stream wherein the stream is heated under non-flame conditions to effect the reaction of hydrogen and oxygen and providing a resulting water vapor containing combined gaseous stream,

c. subsequently splitting the resulting combined gaseous stream and recycling a regulated proportion thereof into admixture with the dissociated charge stream as aforesaid, and

d. effecting the regulation of the quantity of such recycle portion of the combined gaseous stream responsive to the sensing of the temperature level at said high temperature recombiner zone so that there is maintained an oxygen content therein below an explosive level.

3,937,797
PRODUCTION OF HARD TITANIA

Andrzej Antoni Florian Romanski; Derek John Brookes, both of Sheffield; Anthony Smith, Rotherham, and Harry Markham, Sheffield, all of England, assignors to British Steel Corporation (Chemicals) Limited, Great Britain

Filed June 3, 1974, Ser. No. 475,910

Claims priority, application United Kingdom, June 4, 1973, 26484/73

Int. Cl.[2] **B01J** *9/02, 35/02;* **C01G** *23/04;* **C22B** *34/00*

U.S. Cl. 423—610 **7 Claims**

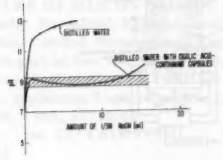
1. A method of hardening powdered titania comprising thoroughly dispersing a composition consisting essentially of commercial pigment grade anatase or rutile in a large excess of water, removing excess water to form a paste of said titania and water, drying said paste and then calcining the titania at a temperature of 650°C to 900°C.

3,937,798

METHOD OF CONTROLLING HYDROGEN ION CONCENTRATION BY MICROCAPSULES

Masao Kitajima, and Asaji Kondo, both of Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 17, 1971, Ser. No. 172,535
Claims priority, application Japan, Aug. 17, 1970, 45-71962
Int. Cl.[2] C02B *1/30*
U.S. Cl. 423—659 17 Claims



1. A method for controlling the hydrogen ion concentration of an aqueous alkali solution which comprises adding to the aqueous alkali solution an aqueous solution containing a dispersion of microcapsules prepared by encapsulating an acid material with a polymer which is non-permeable prior to attack by alkali, said polymer being swelled in an alkali state only, the term "swelled" meaning the attacking of said polymer by said solution so that the microcapsule shell is swelled to increase the permeability thereof and thus permit part of the acid within said microcapsule to be released into the solution to neutralize alkali present.

3,937,799

RADIOASSAY OF VITAMIN B-12 EMPLOYING BENTONITE

Nathan Lewin, Corte Madera; James E. Fries, Novato, and C. Steven Richards, Vallejo, all of Calif., assignors to Bio-Rad Laboratories, Richmond, Calif.

Filed Aug. 26, 1974, Ser. No. 500,967
Int. Cl.[2] G01N *31/00*; G21H *5/02*
U.S. Cl. 424—1 7 Claims

4. An improved radioassay for vitamin B-12 including the steps of providing a first solution containing acid and a preselected amount of radioactive vitamin B-12; providing a blood serum sample; combining a second solution containing cyanide ions with said first solution and said blood serum sample; heating said last-named combination of solutions to reduce the binding capacity of the serum proteins to free vitamin B-12 therefrom; providing a third solution containing intrinic factor (IF) and human serum albumin; combining said third solution with a cooled combination of said first solution, second solution and serum sample following said heating step to competitively bind a portion of the radioactive vitamin B-12 and serum vitamin B-12 by said IF; and separating free radioactive vitamin B-12 and free serum vitamin B-12 from radioactive vitamin B-12 and serum vitamin B-12 bound by said IF.

3,937,800

BRONCHOGRAPHIC X-RAY CONTRAST METHOD

Peter Dure-Smith, and Roger L. Schnaare, both of 1500 Spring Garden St., Philadelphia, Pa. 19101

Continuation-in-part of Ser. No. 272,632, July 17, 1972, abandoned. This application Apr. 3, 1974, Ser. No. 457,462
Int. Cl.[2] A61K *29/02*
U.S. Cl. 424—4 1 Claim

1. In the process of producing a bronchiograph using tantalum the improvement which comprises employing the tantalum in a composition comprising about 20 to about 70% by weight of finely divided tantalum metal having an average diameter of from about 0.5 to about 30 microns and from about 5% to about 15% of a metallic soap which is oil soluble and prepared from a hydroxide of a polyvalent metallic ion and a fatty acid containing from about 12 to about 18 carbon atoms, dispersed in a liquid vehicle which comprises the remainder of the composition said vehicle having an apparent viscosity of from about 100 centipoise to about 1,000 centipoise at body temperature as measured by a Brookfield Viscometer, and exhibiting non-Newtonian flow properties in an effective amount and administering said composition.

3,937,801

REDUCING THE INCIDENCE OF GASTROINTESTINAL SIDE EFFECTS DURING THE TREATMENT OF INFLAMMATORY CONDITIONS WITH ANTIINFLAMMATORY DRUGS

Wilbur Lippmann, Montreal, Canada, assignor to American Home Products Corporation, New York, N.Y.

Filed July 10, 1973, Ser. No. 378,112
Int. Cl.[2] A61K *31/19*, *31/40*, *31/61*
U.S. Cl. 424—10 2 Claims

1. A method of reducing the incidence of gastrointestinal side effects in a mammal during the treatment of inflammatory conditions with an antiinflammatory agent, which comprises administering to said mammal a gastrointestinal side effect inhibiting amount within the range of about 1.0 microgram to about 10 milligrams per kilogram of trans, cis-7-[2-(3-hydroxy-4,4-dimethyl-1-octenyl)-5-oxocyclopentyl]-5-heptenoic acid during said treatment.

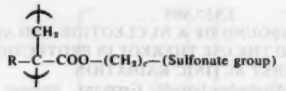
3,937,802

SPRAYABLE HAIR-SETTING COMPOSITION CONTAINING A SULFONATE CONTAINING HYDROPHILIC COPOLYMER

Takehiko Fujimoto, Habayoshi; Tetsuo Kakehi, Kyoto, and Kazumichi Susaki, Gojobashi-higashi, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Aug. 23, 1973, Ser. No. 390,848
Claims priority, application Japan, Aug. 24, 1972, 47-84854
Int. Cl.[2] A61K *7/11*
U.S. Cl. 424—47 3 Claims

1. A sprayable hair-setting composition which comprises a hydrophilic copolymer and a solvent selected from the group consisting of water, a (C_1–C_4) aliphatic alcohol, dioxane, methylethyl ketone, acetone, tetrahydrofuran, ethylene glycol monomethyl ether, ethylene glycol monoethyl ether and mixtures thereof and a propellant, said hydrophilic copolymer having 3–95 per cent by weight of a structural unit of the formula



wherein R is H or methyl and c is an integer from 1 to 3 and 97 to 5% by weight of at least one comonomer selected from the group consisting of a (C_1–C_{20}) alkyl acrylate, a (C_1–C_{20}) alkyl methacrylate, a (C_1–C_4) hydroxyalkyl acrylate, and a (C_1–C_4) hydroxyalkyl methacrylate, said hydrophilic copolymer being present in an amount effective to set hair.

3,937,803

FLAVORED DENTAL CREAMS

Thomas James Delaney, Piscataway, and William Grant Pierson, Flanders, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 295,068, Oct. 4, 1972, abandoned. This application Apr. 30, 1974, Ser. No. 465,461

Int. Cl.² A61K *7/16*

U.S. Cl. 424—49 **11 Claims**

1. A toothpaste containing about 20 to 60% of abrasive particles comprising at least about 25% sodium bicarbonate in a vehicle containing sufficient liquids and including a water-glycerol mix, the water-glycerol ratio being in the range of about 0.4 to 0.7:1, said vehicle consisting essentially of about 5 to 35% water and said glycerol, and a sufficient amount of gelling or thickening agent to impart to the dental cream the pasty consistency, body and non-tacky nature which is characteristic of conventional dental creams or toothpastes, said toothpaste containing a water-insoluble essential oil flavoring agent in the range of about 0.5 to 1.5%, said sodium bicarbonate being primarily in the undissolved solid state, said dental cream having a granular textured appearance comprising a substantially dispersed non-crystalline appearing granulate of macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix.

3,937,804

TOOTHPASTE

Thomas James Delaney, Piscataway, and William Grant Pierson, Flanders, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 419,741, Nov. 28, 1973, which is a continuation-in-part of Ser. Nos. 295,094, Oct. 4, 1972, abandoned, and Ser. No. 389,827, Aug. 20, 1973, abandoned. This application Apr. 30, 1974, Ser. No. 465,463

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **11 Claims**

1. A dental cream containing an abrasive content comprising at least about 20% sodium bicarbonate in a vehicle containing sufficient liquids, said vehicle consisting essentially of about 5 to 35% water admixed with about 45 to 15% viscous water miscible polyol humectant or mixtures thereof, and a sufficient amount of gelling or thickening agent to impart to the dental cream the pasty consistency, body and the non-tacky nature which is characteristic of conventional dental creams or toothpastes, and over 1% of a water-insoluble dental abrasive material compatible with said bicarbonate in the dental cream and about 0.01 to 1.% fluorine selected from the group of water soluble fluorine salts consisting of sodium, potassium, ammonium, lithium and amine fluorides; complex water soluble fluorine salts selected from the group consisting of fluorosilicate, fluorozirconate, fluorostannite, fluoroborate, fluorotitanate and fluorogermanate and organic fluorides selected from the group consisting of mono-, di-, and triethanolamine hydrofluoride, said sodium bicarbonate being primarily in the undissolved solid state, said dental cream having a granular textured appearance comprising a substantially dispersed non-crystalline appearing granulate of macroscopic crystalline bicarbonate granules in an otherwise smooth continuous matrix.

3,937,805

METHOD OF MAKING DENTIFRICE COMPOSITIONS CONTAINING INSOLUBILIZED SALTS OF 1,6-DI-(P-CHLOROPHENYL BIGUANIDO) HEXANE

Michael Harrison, Newcastle Upon Tyne, England, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 197,498, Nov. 10, 1971, abandoned. This application Dec. 13, 1973, Ser. No. 424,388

Int. Cl.² A61K *7/18, 7/22;* **C09F** *5/00;* **C07C** *129/08*

U.S. Cl. 424—52 **15 Claims**

1. A method of preparing a dentifrice composition which comprises mixing in a dentifrice vehicle a non-toxic insolubilized salt of 1,6-di-(p-chlorophenyl biguanido) hexane antimicrobial agent in amount corresponding to about 0.01–5% by weight of the free base thereof wherein said antimicrobial agent is in the form of a monomer salt selected from the group consisting of disarcosinate salt and dibenzoate salt and a polymer salt.

3,937,806

ORAL COMPOSITIONS FOR CARIES PROPHYLAXIS

William Edward Cooley, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 52,774, July 6, 1970, which is a continuation-in-part of Ser. No. 848,081, Aug. 6, 1969, abandoned, which is a continuation-in-part of Ser. No. 737,328, June 17, 1968, abandoned, which is a continuation-in-part of Ser. No. 546,511, May 2, 1966, abandoned. This application May 7, 1974, Ser. No. 467,693

Int. Cl.² A61K *7/18*

U.S. Cl. 424—52 **4 Claims**

1. An oral composition for caries prophylaxis comprising (1) a water-soluble fluoride salt in a quantity sufficient to provide from about 100 to about 4000 p.p.m. of fluoride ion, and (2) an indium-malic acid water-soluble complex, the molar ratio of malic acid to indium being in a range of from about 1:1 to about 6:1, said composition having a total In(III) content of from about 10 to about 7,500 p.p.m. and a pH in the range from about 4.0 to 6.5.

3,937,807

ORAL COMPOSITIONS FOR PLAQUE, CARIES, AND CALCULUS RETARDATION WITH REDUCED STAINING TENDENCIES

John William Haefele, Sarasota, Fla., assignor to The Procter & Gamble Company, Cincinnati, Ohio

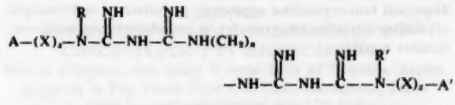
Continuation-in-part of Ser. No. 338,463, March 6, 1973, abandoned. This application July 9, 1974, Ser. No. 486,800

Int. Cl.² A61K *7/16, 7/18, 7/22*

U.S. Cl. 424—52 **11 Claims**

1. An oral composition effective in inhibiting bis-biguanide tooth staining and the formation of plaque, caries and calculus comprising a carrier suitable for use in the oral cavity, and

A. from about 0.01% to about 2.5% by weight of a tooth-staining bis-biguanide compound, otherwise tending to produce a rather offensive brown tooth stain, and having the generic formula:



wherein A and A′ each represent either (1) a phenyl radical which can contain as substituents up to two alkyl or alkoxy groups containing from 1 to about 4 carbon atoms, a nitro group, or a halogen atom; (2) an alkyl group containing from 1 to about 12 carbon atoms; or (3) alicyclic groups containing from 4 to about 12 carbon atoms; wherein X and X′ each represent an alkylene radical containing from 1 to 3 carbon atoms; wherein z and z' each can be either 0 or 1; wherein R and R′ each represent either hydrogen, an alkyl radical containing from 1 to about 12 carbon atoms, or an aralkyl radical containing from 7 to about 12 carbon atoms; wherein n is an integer from 2 to 12 inclusive; and wherein the polymethylene chain $(CH_2)_n$ can be interrupted by up to 5 ether, thioether, phenyl, or naphthyl moieties; or the pharmaceutically acceptable salts thereof; and

b. from about 0.10% to about 1.25% by weight, in excess of the molar amount which will react with the bis-biguanide compounds of an amino carboxylate compound which in said concentration range effectively reduces said bis-biguanide tooth stain, without precipitating said tooth-staining bis-biguanide, and which is selected from the group consisting of nitrilo triacetic acid and its pharmaceutically acceptable water-soluble salts; said composition having a pH of from about 4.5 to about 8.0.

3,937,808

SUN TANNING AND HAIR PROTECTING ACID SALTS OF AMINOMETHYL-O-HYDROXYPHENONES COMPOSITIONS

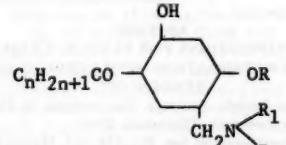
Albert F. Strobel, Delmar, N.Y., assignor to GAF Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 230,458, Feb. 29, 1972, abandoned. This application Dec. 17, 1973, Ser. No. 425,693

Int. Cl.² A61K *7/06, 7/42, 31/12;* **A61L** *13/00*

U.S. Cl. 424—59 **9 Claims**

1. A sun tanning and hair protecting composition comprising between about 0.4% and about 10% by weight of a compound selected from the group consisting of acid addition salts of a compound having the formula:



wherein R is hydrogen or an alkyl having from 1–4 carbon atoms, R_1 and R_2 each represents an alkyl having from 1–4 carbon atoms and n has a value of 1 to 3, said compound having ultra-violet absorption in the sun burning range of 300–350 mμ while transmitting radiation in the sun tanning range; and a carrier selected from the group consisting of water, vegetable oil, mineral oil, and aqueous solutions of methanol, ethanol, glycerol and isopropanol.

3,937,809

ADDITION COMPOUND OF A NUCLEOTIDE AND AN AMINO ACID AND THE USE THEREOF IN PROTECTION AGAINST ACTINIC RADIATION

Otto K. Jacobi, Wiesbaden-Igstadt, Germany, assignor to Kolmar Laboratories, Inc., Port Jervis, N.Y.

Filed May 1, 1974, Ser. No. 465,914

Int. Cl.² A61K *7/44;* **C07H** *19/10, 19/20*

U.S. Cl. 424—60 **7 Claims**

1. A topical composition for protection against actinic radiation, comprising a dermatologically acceptable inert carrier suitable for application to human skin, and having dispersed therein from 0.1% to 99.9% by weight of a compound of the formula:

$$[\text{Nucleoside } (PO_3)_n.Me_{n+1}]AS_m$$

wherein the nucleoside is a glycoside of a compound selected from the group consisting of adenine, guanine, cytosine, uracil and thymine; Me is a cation selected from the group consisting of hydrogen, an alkali metal, and ammonium; n is an integer from 1 to 3; m is an integer from 1 to $(n+1)$; and AS is acid having from 1 to 20 carbon atoms and selected from the group consisting of an amino carboxylic acid and an amino sulfo acid.

3,937,810

SKIN LIGHTENING COMPOSITION AND METHOD OF USING THE SAME

Girish Prasad Mathur; Kuruvakkat Kochu Govind Menon, and Srinivasan Varadarajan, all of Bombay, India, assignors to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 322,251, Jan. 9, 1972, Pat. No. 3,861,689. This application June 12, 1974, Ser. No. 478,477

Claims priority, application United Kingdom, Jan. 11, 1972, 1236/72

Int. Cl.² A61K *7/135*

U.S. Cl. 424—62 **4 Claims**

2. A cosmetic composition for application to the skin comprising a skin lightening amount of niacin of from about 0.2 to about 10% by weight, from 0.1 to 10% by weight of urocanic acid absorbing in the range of 290–320 nm and a physiologically acceptable carrier for niacin.

3,937,811

FATTY COMPOSITIONS FOR USE IN COSMETIC MAKEUP COMPOSITIONS AND SAID COSMETIC MAKEUP COMPOSITIONS

Christos Papantoniou, Epinay-sur-Seine, and Jean Boulogne, L'Hay-les-Roses, both of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

Filed June 7, 1974, Ser. No. 477,515

Claims priority, application Luxemburg, June 8, 1973, 67772

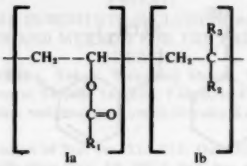
Int. Cl.² A61K *7/025*

U.S. Cl. 424—64 **16 Claims**

1. A fatty composition for use in producing a cosmetic composition selected from the group consisting of a lip rouge and a mascara, comprising a mixture of:

i. at least one cosmetic fatty body consisting essentially of about 6–100% by weight of at least one cosmetic wax and 0–94% of at least one cosmetic oil, and

ii. a non-toxic, fat soluble copolymer having the formula:



Ia Ib

wherein:

R_1 represents a saturated hydrocarbon chain, linear or branched, having from 1 to 19 carbon atoms,

R_2 represents a member selected from the group consisting of

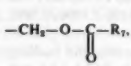
a.

wherein R_4 has the same meaning as R_1 but is different from R_1 in the same copolymer,

b. $-CH_2-R_3$, wherein R_3 represents a saturated hydrocarbon chain, linear or branched, having from 5 to 25 carbon atoms,

c. $-O-R_6$, wherein R_6 represents a saturated hydrocarbon chain, having from 2 to 18 carbon atoms, and

d.



wherein R_7 represents a saturated hydrocarbon chain, linear or branched, having from 1 to 19 carbon atoms, and R_3 represents hydrogen when R_2 represents radicals (a), (b) or (c) or R_3 represents methyl when R_2 represents radical (d), the said copolymer including at least 15% by weight of at least one monomer of unit Ia or unit Ib, wherein said saturated hydrocarbon chain, linear or branched, has at least 7 carbon atoms, said copolymer having a molecular weight between 2,000 and 500,000 and being present in an amount of about 2–35% by weight relative to the total weight of the fatty composition.

11. A cosmetic composition selected from the group consisting of a lip rouge and a mascara comprising the fatty composition of claim 1 in an amount between 99.5 and 15% by weight of the total weight of the cosmetic composition and a dye in an amount of 6–15 weight percent, the amount of said copolymer relative to the total weight of said cosmetic composition being at least 1.5% by weight.

3,937,812

FELINE CALICIVIRUS VACCINE AND PRODUCTION THEREOF

James Long Bittle, Doylestown, Pa., and Wayne J. Rubic, Titusville, N.J., assignors to Pitman-Moore, Inc., Washington's Crossing, N.J.

Division of Ser. No. 525,689, Nov. 21, 1974. This application Aug. 13, 1975, Ser. No. 604,375

Int. Cl.[2] A61K *39/12*

U.S. Cl. 424—89 **14 Claims**

1. A vaccine for immunizing cats against feline calicivirus comprising at least about 10^3 tissue culture infectious doses of an attenuated feline calicivirus per ml, which vaccine is capable of stimulating the production of protective feline calicivirus antibodies comparable to those produced by natural infections when parenterally administered into non-immune cats and without producing the usual pathological symptoms of disease due to feline calicivirus.

3,937,813

INSECTICIDAL COMPOSITIONS COMPRISING MIXTURES OF *BACILLUS THURINGIENSIS* AND CHLORDIMEFORM

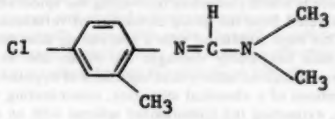
Robert Kingsbury Clark, Jr., St. Petersburg, Fla., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 20, 1974, Ser. No. 444,076

Int. Cl.[2] A01N *9/02, 9/20, 15/00*

U.S. Cl. 424—93 **6 Claims**

1. A composition for inhibiting the growth of lepidopterous larvae on plants comprising 1 to 2 parts of *Bacillus thuringiensis* and 1 part of chlordimeform having the structure



3,937,814

COMPOSITIONS FOR SAFE EXTENSION OF STORAGE LIFE OF FOODS

John T. R. Nickerson, Buzzards Bay, and John R. Darack, Holliston, both of Mass., assignors to Dirigo Corporation, Boston, Mass.

Continuation-in-part of Ser. No. 180,099, Sept. 13, 1971, abandoned. This application Mar. 29, 1974, Ser. No. 455,987

Int. Cl.[2] A61K *37/00*; A23B *4/00, 7/00*

U.S. Cl. 424—93 **6 Claims**

1. A spoilage control composition for use with food products highly susceptible to contamination and spoilage selected from the group of foods consisting of custard-type foods, salads and fish fillets, comprising: the combination of an inoculum of bacteria and an organic acid compound which inhibits the growth of common food-borne disease and spoilage organisms in the temperature range of approximately 40° to 86° F., but only slightly inhibits the growth of the inoculum at such temperatures; the inoculum being a non-pathogenic member of the Lactobacteriaciae which is characterized as growing in food in the temperature range of approximately 40° to 86° F.; said inoculum being either *Pediococcus cerevisiae* or *Lactobacillus viridescens;* said orgnaic acid compound being a mixture of sorbic acid compound with propionate compound; said sorbic acid compound being either sorbic acid, potassium sorbate or sodium sorbate and said propionate compound being either sodium propionate or potassium propionate or calcium propionate; each said compound being present at a concentration of at least 0.10%; said composition being characterized in that the growth of common disease and spoilage organisms in such food are inhibited, but said inoculum grows for a finite period of time until it causes an undesirable flavor in the foods, thus causing the food to be discarded.

3,937,815

LYSOZYME DERIVATIVES

Tiberio Bruzzese, and Rodolfo Ferrari, both of Milan, Italy, assignors to SPA—Societa Prodotti Antibiotici S.p.A., Italy

Filed Dec. 5, 1975, Ser. No. 530,022

Int. Cl.[2] C07C *103/52*; A61K *37/00*

U.S. Cl. 424—94 **10 Claims**

1. A salt or complex of a member selected from the group consisting of lysozyme, guanidyl lysozyme, methyl lysozyme and methyl guanidyl lysozyme with a bile acid.

3,937,816

GROWTH REGULATING COMPOSITIONS EXTRACTED FROM SPLEEN

Karl-Heinz Jaeger, Freiburg, and Hellmut Mittenzwei, Munich, both of Germany, assignors to Solco Basel AG, Birsfelden, Switzerland

Continuation of Ser. No. 64,033, July 21, 1970, abandoned, which is a continuation of Ser. No. 344,182, Feb. 12, 1964, abandoned, which is a continuation-in-part of Ser. No. 503,344, April 22, 1955, abandoned. This application Mar. 4, 1974, Ser. No. 447,939

Int. Cl.[2] A61K *35/28*

U.S. Cl. 424—95 8 Claims

1. A process for the preparation of compositions derived from spleens which comprises recovering the spleens of vertebrata selected from the group consisting of vertebrata whose spleen has been irradiated with a stimulating dose below the dose which irreparably damages the organ and vertebrata which have received intravenous injections of hypotonic aqueous solutions of a chemical stimulant, comminuting the said spleens, extracting the comminuted spleens with an aqueous solution, precipitating proteins from the aqueous extract by the addition thereto of a member selected from the group consisting of lower alkanols, perchloric acid and trichloroacetic acid, neutralizing the protein-free solution and subjecting it to dialysis with a membrane adapted to pass compounds having a molecular weight up to 4500, extracting fatty material from the resulting inner dialysate with a lower alkyl ether to obtain a clear aqueous solution and concentrating the resulting aqueous inner dialysate solution to a concentration of 10 to 60 mg of solid per milliliter of solution.

3,937,817

PHARMACEUTICAL COMPOSITIONS CONTAINING A SACCHARASE INHIBITOR

Werner Frommer; Walter Puls, and Delf Schmidt, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 336,741, Feb. 28, 1973. This application June 20, 1974, Ser. No. 481,224

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—115 2 Claims

1. A pharmaceutical composition containing as an active ingredient a therapeutically effective quantity of a saccharase inhibitor mixed with a solid or semi-liquid diluent, wherein said saccharase inhibitor is produced by a method comprising growing Actinoplanaceae strain CBS 961.70 in a starch-free nutrient medium to produce a culture and separating the saccharase inhibitor from the culture.

3,937,818

BENZYLAMINE NARCOTIC ANTAGONISTS

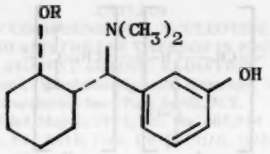
Horace Fletcher, Pottstown; Jerry L. Malis, Bluebell, and John P. Yardley, King of Prussia, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 27, 1974, Ser. No. 455,172

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 8 Claims

1. A process for antagonizing the effect of a narcotic agent in warm-blooded animals which comprises administering to a warm-blooded animal in need thereof a sufficient amount of a compound of the formula:



wherein R is ethyl or benzyl; and the pharmacologically acceptable acid addition salts thereof.

3,937,819

METHOD OF STABILIZING AN INJECTABLE COMPOSITION OF A CHOLECYSTOKININ ACTIVE OCTAPEPTIDE

Miguel Angel Ondetti, Princeton; Charles Riffkin, Edison; Bernard Rubin, Lawrence Township, and Aaron L. Weiss, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 22, 1974, Ser. No. 490,644

Int. Cl.[2] A61K *37/00;* C07C *103/52*

U.S. Cl. 424—177 1 Claim

1. A method of enhancing the stability of the octapeptide

against degradation during storage, which comprises lyophilizing a solution containing per liter about 2500 mcg of said octapeptide and about 21.43 g of sodium chloride, and a sufficient quantity of water for injection to adjust the volume to about 1 liter, the pH of the solution being adjusted to from 5.50 to 6.50, if necessary, by addition of sodium hydroxide or hydrochloric acid.

3,937,820

INSULIN COMPOSITION PROVIDING ALTERNATIVES TO IMMUNOLOGICAL RESISTANCE

Adolf Mager, Niedernhausen; Hans-Hermann Schöne, Bad Soden, Taunus; Rolf Geiger, Frankfurt am Main, and Franz Enzmann, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 14, 1973, Ser. No. 415,635

Claims priority, application Germany, Nov. 16, 1972, 2256215

Int. Cl.[2] A61K *37/26;* C07C *103/52*

U.S. Cl. 424—178 4 Claims

1. An insulin composition for providing an alternative to an immunological resistance to insulin of different mixed species of insulin which comprises, in an aqueous suspension, a crystallized insulin and an amorphous des-phenyl-alanine^{B1} insulin of the same species, having a pH value in the range of from 6.8 to 7.6, containing zinc ions in an amount of up to 340γ/100 I.U., wherein the insulin crystals have a uniform size of from 15 to 35 microns; wherein the ratio of crystallized insulin to amorphous des-phenyl-alanine^{B1} insulin ranges from 60 : 40 to 80 : 20; and wherein the insulin content is from 40 to 80 I.U. per ml.

3,937,821

PLASMA SUBSTITUTE INCLUDING ARTIFICIAL STARCH AND METHOD FOR THE PREPARATION THEREOF

Tsutomu Irikura, Tokyo; Kazunari Shirai, Tokyo; Mamoru Tada, Urawa; Terumi Tamada, Tokyo, and Jun Imai, Ageo, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Japan

Continuation of Ser. No. 213,553, Dec. 29, 1971. This application Nov. 19, 1973, Ser. No. 416,725

Claims priority, application Japan, Aug. 21, 1971, 46-63838

Int. Cl.[2] A01N *9/28*

U.S. Cl. 424—180 5 Claims

1. A process for preparing a plasma substitute for injection by treating hydroxyethyl starch having a DS of 0.5–0.6 and an intrinsic viscosity of 0.28–0.30 dl/g in water with dilute hydrochloric acid to obtain a hydroxyethyl starch solution having a DS of 0.5–0.6 and an intrinsic viscosity of 0.08–0.14 dl/g, adding physiologically acceptable electrolytes and glucose to the solution and then diluting the solution with sufficient water to give an isotonic plasma substittute having an oncotic pressure and osmotic pressure equal to those of plasma.

3,937,822

METHOD FOR TREATING PSORIASIS

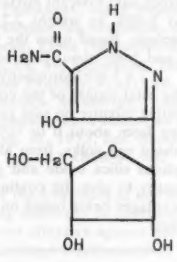
Donald C. DeLong, and Koert Gerzon, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed July 22, 1974, Ser. No. 490,626

Int. Cl.[2] A61K *31/71*

U.S. Cl. 424—181 5 Claims

1. The method of treating psoriasis in humans comprising the administration to a patient suffering from psoriasis an effective dose for treating psoriasis of a compound having the formula



3,937,823

TOPICAL ANTI-INFLAMMATORY COMPOSITIONS AND METHODS OF USE

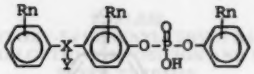
Frank Jeng Dea, Newport Beach, and Richard Allen Schroer, Silverado, both of Calif., assignors to Nelson Research & Development Co., Irvine, Calif.

Filed Oct. 18, 1974, Ser. No. 515,906

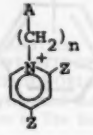
Int. Cl.[2] A61K *31/66*, *31/44*

U.S. Cl. 424—210 14 Claims

1. A composition for treating inflammation comprising about 0.1 to about 5% of an active compound having the structural formula



where R is selected from the group consisting of H, lower alkyl, lower alkoxy, halogen, CF_3, NO_2, OH, CN, $COOR_1$, $CONR_1R_2$, $NHCOR_1$ and NR_1R_2, R_1 and R_2 are each selected from the group consisting of H and lower alkyl, R, R_1 and R_2 being the same or different, and *n* is 0–5; and where X is selected from the group consisting of an alkyl chain and an alkenyl chain having 2–8 carbon atoms, one of which carbon atoms may be in the form of a carbonyl group; and Y is selected from the group consisting of hydrogen, alkyl, aryl, aralkyl or aryl and aralkyl substituted with one or more R, and pharmaceutically acceptable salts thereof, together with a topical pharmaceutical carrier containing an effective amount of an active radical having the structural formula



where *n* is 1–4, A is selected from the group consisting of H and

Z is selected from the group consisting of H, —CH=NOH and CONHOH where one and only one Z in each heterocyclic ring is H.

3,937,824

COMPOSITIONS AND METHODS OF KILLING INSECTS AND ACARIDS USING ALKOXYIMINO CARBAMOYLOXY PHOSPHORUS COMPOUNDS

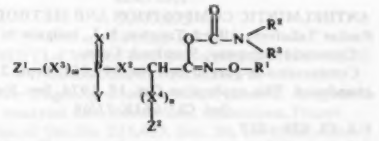
Leonard J. Stach, Riverside, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 311,079, Dec. 1, 1974, Pat. No. 3,835,205. This application Aug. 19, 1974, Ser. No. 498,496

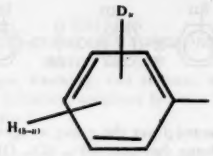
Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—211 3 Claims

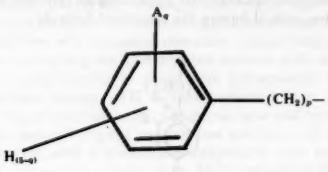
1. An insecticidal or acaricidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to insects or acarids, a compound of the formula



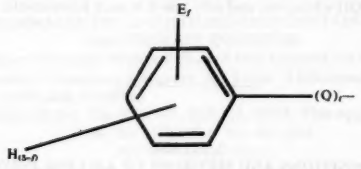
wherein R^1 is lower alkyl; R^2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl and lower haloalkyl; R^3 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, lower haloalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein D is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, chlorine, bromine, fluoring, lower haloalkyl, nitro and di(lower alkyl-)amino; u is an integer from 0 to 3; X^1, X^2, X^3 and X^4 are independently selected from the group consisting of oxygen and sulfur; m and n are each integers from 0 to 1; Z^1 is selected from the group consisting of lower alkyl, lower alkenyl and



wherein A is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, lower haloalkyl, chlorine, bromine, fluoring, nitro, lower alkylsulfoxide, lower alkylsulfone and di(lower alkyl)amino; and q and p are each integers from 0 to 3; Z^2 is selected from the group consisting of hydrogen and Z^1, provided that when Z^2 is hydrogen then n is zero; and Y is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, lower alkylthio, amino, lower alkylamino, di(lower alkyl)amino and



wherein E is selected from the group consisting of lower alkyl, lower alkenyl, lower alkoxy, lower alkylthio, chlorine, bromine fluorine, nitro, lower alkylsulfoxide, lower alkylsulfone and di(lower alkyl)amino; f is an integer from 0 to 3; Q is selected from the group consisting of oxygen, sulfur, lower alkylene, lower alkyleneoxy and lower alkylenethio; and t is an integer from 0 to 1.

3,937,825

ANTHELMINTIC COMPOSITION AND METHOD OF USE

Booker Taliaferro Alford, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 399,651, Sept. 21, 1973, abandoned. This application Oct. 15, 1974, Ser. No. 514,726

Int. Cl.² A61K *31/66*

U.S. Cl. 424—217 **2 Claims**

1. An anthelmintic composition for controlling strongyles in equine species comprising 0,0-dimethyl (2,2,2-trichloro-1-hydroxyethyl)phosphonate and 1-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole hydrochloride in an amount of from 4 grams to about 40 grams in a weight ratio of 5 parts by weight of 0,0-dimethyl (2,2,2-trichloro-1-hydroxyethyl)phosphonate to each part by weight of 1-6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]-thiazole thiazole hydrochloride.

3,937,826

FLY KILLING COMPOSITION

Lewis P. Harris, Prairie Village, Kans., assignor to PBI-Gordon Corporation, Kansas City, Kans.

Continuation-in-part of Ser. No. 359,767, May 14, 1973, abandoned. This application May 3, 1974, Ser. No. 466,781

Int. Cl.² A01N *9/36*

U.S. Cl. 424—219 **3 Claims**

1. A fly killing composition, comprising: from about 2 to 20% by weight, based upon the total weight of the composition, of a dark, organic, absortive granular component comprising:

Beef Meal Scraps and By-Products	15.00 – 20.00%
Dried Poultry By-Products	10.00 – 15.00%
Cottonseed Meal	15.00 – 20.00%
Soybean Meal	10.00 – 15.00%
Pulverized Milo	15.00 – 20.00%
Wheat Middlings	1.00 – 5.00%
Dehydrated Alfalfa Meal	10.00 – 15.00%

wherein all precentages immediately above are given on a weight basis and separately total 100%;

from about 70 to 90% by weight, based upon the total weight of the composition of a cooked yellow, sugar-based granular component comprising:

Sugar	40.00 – 60.00%
Corn Syrup	10.00 – 15.00%
Corn Grits	20.00 – 30.00%
Corn Cereal	5.00 – 10.00%
Egg Yolk Powder	0.01 – 0.10%
Milk Powder	0.25 – 1.00%
Vegetable Oil	1.00 – 5.00%
Yellow Food Grade Coloring	0.15 – 0.50%

wherein all precentages immediately above are given on a weight basis and separately total 100%;

a toxicant mixture residing on the surface of said granular components and being at least partially absorbed into the interstices thereof, said toxicant mixture comprising from about 0.10 to 3.00% by weight 2,2-dichlorovinyl 0,0-dimethyl phosphate, based upon the total weight of the composition, and from about 0.25 to 2.00% by weight 0,0-dimethyl 0-2,4,5-trichlorophenylphosphorothioate, based upon the total weight of the composition; and

a particulate coating mixture on said granular components and comprising from about 0 to 10% dried milk, from about 0–5% dried egg yolks, from about 0.1 to 5% hydrated amorphous silica oxide and yellow food dye in sufficient quantity to give the coating mixture a yellow color, all percentages being based on the total weight of the composition.

3,937,827

THERAPEUTIC COMPOSITION AND METHOD OF TREATING ADVANCED OR DISSEMINATED MAMMARY CANCER

John C. Babcock, and Roman P. Holysz, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 393,851, Sept. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 160,900, July 8, 1971, abandoned, which is a continuation of Ser. No. 855,050, Sept. 3, 1969, abandoned, which is a continuation-in-part of Ser. No. 823,490, May 9, 1969, abandoned. This application Aug. 30, 1974, Ser. No. 501,885

Int. Cl.² A61K *31/56*

U.S. Cl. 424—243 **1 Claim**

1. A process for producing regression of advanced or disseminated mammary cancer comprising the oral or parenteral administration of 7β,17α-dimethyltestosterone in association

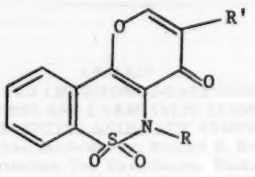
with a pharmaceutical carrier to an adult woman with advanced or disseminated mammary cancer, wherein from about 1 to about 50 mg. of compound selected per kg. of said adult woman's weight/day is administered.

3,937,828
SUBSTITUTED PYRANO[3,2-C][1,2]BENZOTHIAZINE 6,6-DIOXIDES

Daniel Kaminsky, Parsippany; Sylvester Klutchko, Hacketts-town, and Maximilian von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 365,399, May 29, 1973. This application July 31, 1974, Ser. No. 493,292
Int. Cl.² A61K *31/54*
U.S. Cl. 424—246 2 Claims

1. A method for preventing asthmatic symptoms which comprises administering to a mammal in need thereof an effective amount of a compound of the formula:



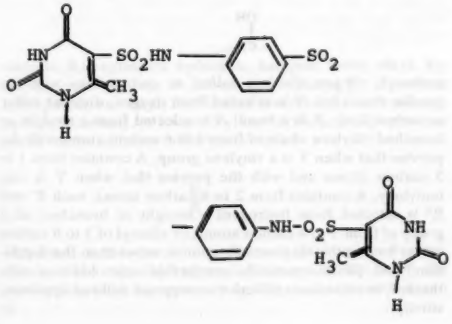
wherein R represents lower alkyl; and R′ represents carboxaldehyde and hydroxymethyl.

3,937,829
MEDICINAL PREPARATION FOR TREATMENT OF VARIOUS FORMS OF LEPROSY

Vladimir Savich Reznik, ulitsa Gospitalnaya 34, kv. 34; Nikolai Grigorievich Pashkurov, ulitsa Druzhby 6, kv. 20; Abdurakhim Abdurakhimovich Muslinkin, ulitsa Zhdanova 60, kv. 33, all of Kazan; Elena Nikolaevna Zhurkina, prospekt Kosmonavtov 86, kv. 48, Leningrad; Nikolai Mikhailovich Goloschapov, ulitsa Druzhby, 9, kv. 110, Zagorsk, and Vladimir Konstantinovich Steklovsky, Zagorsky raion, p/o Krasnozavodsk, Moskovskaya oblast, all of U.S.S.R.

Filed Aug. 31, 1973, Ser. No. 393,676
Int. Cl.² A61K *31/495*
U.S. Cl. 424—250 12 Claims

11. A method for the treatment of leprosy in humans comprising administering internally or parenterally a composition comprising an amount effective against leprosy of p,p-bis(2,4-dioxy-6-methylpyrimidinyl-5-sulfonamido) diphenyl sulfone of the formula:



3,937,830
5-PIVALOYLOXY-5-(1-PHENYLETHYL) BARBITURIC ACID, ANALGETIC COMPOSITION AND METHOD BASED THEREON

Carlos M. Samour, Wellesley, and Julius A. Vida, Billerica, both of Mass., assignors to The Kendall Company, Walpole, Mass.

Continuation of Ser. No. 378,482, July 12, 1973, Pat. No. 3,894,023. This application Nov. 22, 1974, Ser. No. 526,113
Int. Cl.² A61K *31/515*
U.S. Cl. 424—254 2 Claims

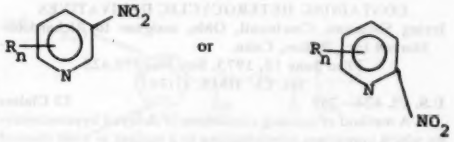
1. A therapeutic composition for treatment of symptoms of pain in a warm-blooded animal comprising a physiologically acceptable carrier and an analgetically effective amount of 5-pivaloyloxy-5-(1-phenylethyl) barbituric acid.

3,937,831
CHLOROMETHYL NITROPYRIDINES AS ANTIMICROBIALS

Jeffrey D. Griffith, Lafayette, and Helen K. Tobol, Concord, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 386,653, Aug. 8, 1973, abandoned. This application Nov. 7, 1974, Ser. No. 521,615
Int. Cl.² A01N *9/22*
U.S. Cl. 424—263 10 Claims

1. A method for killing microbes selected from the group consisting of bacteria and fungi which comprises contacting said microbes with an antimicrobial amount of a chloromethyl nitropyridine compound corresponding to one of the formulae



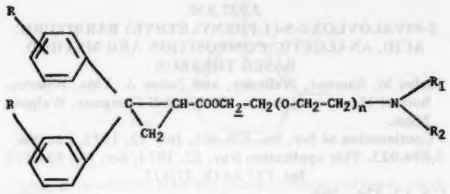
wherein R represents dichloromethyl or trichloromethyl and *n* represents an integer of 1 or 2, with the proviso that when *n* is 2, the R groups are not ortho to each other.

3,937,832
ESTERS OF 2,2-DIPHENYL-CYCLOPROPANE-CARBOXYLIC ACIDS AS COUGH SUPPRESSANTS

Jean-Claude Cognacq, Bourg-la-Reine, France, assignor to Societe anonyme dite: Hexachimie, Malmaison, France

Division of Ser. No. 214,473, Dec. 30, 1971, Pat. No. 3,846,436. This application Mar. 4, 1974, Ser. No. 448,033
Int. Cl.² A61K *31/445*
U.S. Cl. 424—267 14 Claims

1. A cough-suppressing composition comprising (1) an effective, non-toxic amount of an ester of a 2,2-diphenylcyclopropane-carboxylic acid of the formula:



in which R is hydrogen, halogen, lower alkyl, or lower alkoxy, *n* is zero or 1, and R_1 and R_2 taken together form, with the nitrogen to which they are attached, piperidino or lower alkyl-substituted piperidino; or a non-toxic acid addition salt of said ester and (2) a pharmaceutically acceptable excipient.

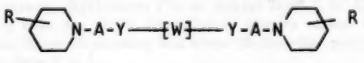
3,937,833

PHARMACEUTICALLY USEFUL NITROGEN CONTAINING HETEROCYCLIC DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,425
Int. Cl.² H61K *31/445*
U.S. Cl. 424—267 13 Claims

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound selected from the formula



wherein [W] is an aromatic polycyclic nucleus selected from fluoranthene, fluorene, fluoren-9-ol, fluoren-9-one, or anthraquinone; each Y is selected from carbonyloxy, carbonylthio, oxygen, divalent sulfur, or carbonyl with the provisos that when Y is carbonyloxy or carbonylthio, [W] is other than fluoren-9-ol or anthraquinone; A is selected from a straight or branched alkylene chain of from 1 to 6 carbon atoms with the proviso that when Y is carbonyloxy or carbonylthio, A contains from 2 to 6 carbon atoms; R is selected from hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, phenyl or benzyl; or pharmaceutically acceptable acid addition salt thereof, in an amount effective to suppress delayed hypersensitivity.

3,937,834

PHARMACEUTICAL PREPARATIONS

Alfred Hunger, Basel, and Hans-Jochen Janssen, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 180,492, Sept. 14, 1971, abandoned. This application Nov. 19, 1973, Ser. No. 417,305
Claims priority, application Switzerland, Oct. 2, 1970, 14614/70
Int. Cl.² A61K *31/175, 31/415*
U.S. Cl. 424—273 3 Claims

1. A pharmaceutical preparation for the treatment of angina pectoris and high blood pressure, containing a β-receptor blocker selected from the group consisting of 1-(2-allyloxyphenoxy)-2-hydroxy-3-isopropylaminopropane and 1-(4-indanyloxy)-2-hydroxy-3-isopropylaminopropane or a non-toxic salt thereof and an α-receptor blocker, 2-[N-(m-hydroxyphenyl)-p-toluidinomethyl]-2-imidazoline, or a non-toxic salt thereof together with a pharmacuetical carrier wherein the β-blocker and the α-blocker are in a ratio of from 5 to 1 to 1 to 40.

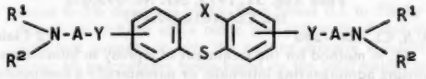
3,937,835

PHARMACEUTICALLY USEFUL SULFUR CONTAINING HETEROCYCLIC DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,424
Int. Cl.² A61K *31/38, 31/39*
U.S. Cl. 424—275 9 Claims

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound selected from the formula



wherein X is selected from a bond, $-CH_2-$, or oxygen; each Y is selected from a vinylene group,

carbonyl, oxygen, divalent sulfur, or carbonyloxy with the proviso that when Y is selected from oxygen, divalent sulfur or carbonyloxy, X is a bond; A is selected from a straight or branched alkylene chain of from 1 to 6 carbon atoms with the proviso that when Y is a vinylene group, A contains from 1 to 5 carbon atoms and with the proviso that when Y is carbonyloxy, A contains from 2 to 6 carbon atoms; each R^1 and R^2 is selected from hydrogen, a straight or branched alkyl group of from 1 to 4 carbon atoms, or alkenyl of 3 to 6 carbon atoms having the vinyl unsaturation in other than the 1-position; and pharmaceutically acceptable acid addition salts thereof, in an amount effective to suppress delayed hypersensitivity.

3,937,836

ANTIBIOTIC COMPOUNDS FOR RUMINANT FEED UTILIZATION IMPROVEMENT

Arthur P. Raun, New Palestine, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 323,599, Jan. 15, 1973, Pat. No. 3,839,557, which is a continuation-in-part of Ser. No. 220,304, Jan. 24, 1972, Pat. No. 3,794,732. This application June 3, 1974, Ser. No. 475,720

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **10 Claims**

1. A method of increasing the efficiency of feed utilization by ruminant animals having a developed rumen function which comprises the oral administration to such animals of a propionate-increasing amount of an antibiotic selected from the group consisting of X206, dianemycin, nigericin, the deshydroxymethyl derivative of nigericin, and their physiologically acceptable esters and salts.

3,937,837

SUBSTITUTED CHROMONE-3-CARBONITRILES, CARBOXAMIDES AND CARBOXYLIC ACIDS USEFUL FOR PREVENTING ASTHMATIC SYMPTOMS

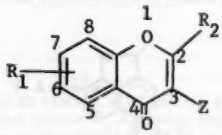
Sylvester Klutchko, Hackettstown; Richard E. Brown, Hanover, and Maximilian Von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 312,154, Dec. 4, 1972, Pat. No. 3,862,143. This application Sept. 9, 1974, Ser. No. 504,628

Int. Cl.² A61K *31/35*

U.S. Cl. 424—283 **1 Claim**

1. A method for preventing asthmatic symptoms in a mammal in need thereof which comprises the administration of from about 5 to about 100 mg/kg of body weight of a compound of the formula:



wherein R_1 represents hydrogen, halogen, lower alkyl, hydroxy, lower alkoxy, or lower alkanoyloxy; R_2 represents hydrogen, lower alkyl, fluorinated lower alkyl, lower alkoxycarbonyl, carboxy, or lower alkyl carboxylic acid; Z represents cyano, carboxy, lower alkoxycarbonyl or

wherein X represents amino, N-lower-alkyl-amino, hydroxylamino, N-lower-alkylhydroxylamino, or ureido, with the proviso that when R_2 represents hydrogen, Z represents cyano or

wherein X has the same meaning as given above; or the corresponding non-toxic, pharmaceutically acceptable salts thereof.

3,937,838

ORALLY ACTIVE BRONCHOSPASMOLYTIC COMPOUNDS AND THEIR PREPARATION

Kjell Ingvar Leopold Wetterlin, Sandby, and Leif Ake Svensson, Lund, both of Sweden, assignors to Aktiebolaget Draco, Lund, Sweden

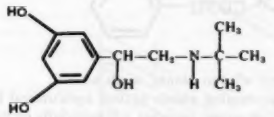
Continuation of Ser. Nos. 55,791, July 17, 1970, and Ser. No. 55,676, July 17, 1970, each is a continuation-in-part of Ser. No. 676,288, Oct. 18, 1967, abandoned. This application June 21, 1973, Ser. No. 372,497

Claims priority, application Sweden, Oct. 19, 1966, 14182/66

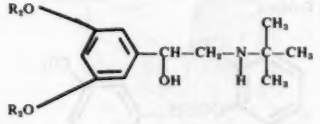
Int. Cl.² A61K *31/22, 31/135*

U.S. Cl. 424—311 **7 Claims**

1. A method of producing bronchial dilation in animals, including humans, in need therof, comprising the administration of a therapeutically effective amount of a compound selected from the group consisting of ethanol amines having the formulas



and



wherein R_5 is the acyl radical of a 2–5 carbon fatty acid and pharmaceutically acceptable salts thereof.

3,937,839

METHOD FOR ATTENUATING BLEEDING

Donald P. Strike, St. Davids; Wenling Kao, Devon, and Richard L. Fenichel, Wyncote, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 446,835, Feb. 28, 1974. This application Apr. 11, 1975, Ser. No. 567,448

Int. Cl.² A61K *31/19*

U.S. Cl. 424—317 **5 Claims**

1. A method for the attenuation of bleeding at a wound surface which comprises the topical application to the wound surface of an effective amount of a compound selected from the group consisting of:

a. 7-(5α-hydroxy-2β-[(3RS)-3-hydroxy-3-methyl-trans-1-octenyl]-3α-methyl-1α-cyclopentyl)-cis-5-heptenoic acid;

b. 7-(5α-hydroxy-2β-[(3RS)-3-hydroxy-3-methyl-trans-1-octenyl]-1α-cyclopentyl)-cis-5-heptenoic acid; and

c. 7-(2β-[(3RS)-hydroxy-3-methyl-trans-1-octenyl]-5-oxo-1α-cyclopentyl)-cis-5-heptenoic acid.

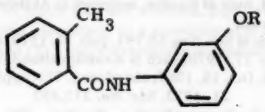
3,937,840

COMPOSITIONS AND METHODS OF COMBATTING BACTERIA AND FUNGI USING 2-METHYLBENZANILIDE DERIVATIVES

Isao Chiyomaru, Shimizu; Seigo Kawada, Fujieda, and Kiyoshi Takita, Shimizu, all of Japan, assignors to Kumiai Chemical Industry Co., Ltd., Tokyo, Japan

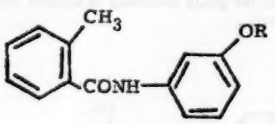
Filed July 17, 1974, Ser. No. 489,412
Claims priority, application Japan, Aug. 18, 1973, 48-92702
Int. Cl.[2] A01N 9/20, 9/24
U.S. Cl. 424—324 6 Claims

1. A method of protecting plants against agricultural fungi or bacteria, which comprises: applying a fungicidally or bacteriocidally effective amount of a 2-methylbenzanilide compound having the formula



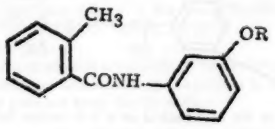
wherein R represents C_{1-12} alkyl, to plants, seeds or soil.

2. A method of protecting plants against agricultural fungi or bacteria, which comprises: applying a fungicidally or bactericidally effective amount of a 2-methylbenzanilide compound having the formula



wherein R represents allyl to plants, seeds or soil.

3. A method of protecting plants against agricultural fungi or bacteria, which comprises: applying a fungicidally or bactericidally effective amount of a 2-methylbenzanilide compound having the formula



wherein R represents propargyl to plants, seeds or soil.

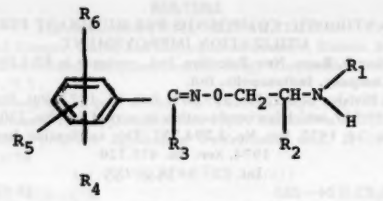
3,937,841

TREATMENT OF DEPRESSION

Jan Van Dijk, and Jenkins Eric Davies, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 279,971, Aug. 11, 1972. This application Oct. 24, 1974, Ser. No. 517,519
Int. Cl.[2] A61K 31/15, 31/36, 31/39, 31/44, 31/54
U.S. Cl. 424—327 4 Claims

1. The method of combatting depression in a mammal exhibiting depressive symptoms comprising administering to said mammal an antidepressively effective quantity of an antidepressive composition suitable for administration to mammals comprising an antidepressive amount of a compound of the formula



or salts thereof with pharmaceutically acceptable acids wherein R_1 is a moiety selected from the group consisting of hydrogen and methyl, R_2 is a moiety selected from the group consisting of hydrogen and methyl, R_3 is a moiety selected from the group consisting of hydrogen, alkyl, alkoxyalkyl alkylthioalkyl, alkylsulphoxyalkyl each of up to eight carbon atoms and benzyo, R_4 and R_5 are each moieties selected from the group consisting of hydrogen, alkoxy of up to six carbon atoms, alkyl of up to six carbon atoms and halogen and R_6 is a moiety selected from the group consisting of trifluoromethyl and halogen with the proviso that at least one of R_1, R_2 and R_3 is other than hydrogen when two of R_4, R_5 and R_6 are ortho-chloro.

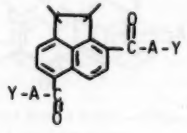
3,937,842

METHOD OF TREATING CONDITIONS OF DELAYED HYPERSENSITIVITY USING BIS-BASIC SUBSTITUTED ACENAPHTHENE DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Filed June 15, 1973, Ser. No. 370,289
Int. Cl.[2] A61K 31/135
U.S. Cl. 424—330 4 Claims

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a 3,6-bis-basic ketone of acenaphthene having the formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and Y is selected from the group consisting of:

(a)

wherein R_1 and R_2 are individually selected from the group consisting of hydrogen, lower alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 3 to 6 carbon atoms, alkenyl having from 3 to 6 carbon atoms in which the unsaturation is in a position other than the 1-position of the alkenyl group;

and the pharmaceutically acceptable salts thereof, in an amount effective to suppress delayed hypersensitivity.

3,937,843

BEAN-ODOR-FREE SOY BEAN PRODUCT AND ITS PRODUCTION

Motomi Osaka, Osaka, and Yukio Hashimoto, Izumiotsu, both of Japan, assignors to Fouji Oil Co., Ltd., Osaka, Japan

Filed Dec. 4, 1973, Ser. No. 421,697
Claims priority, application Japan, Dec. 4, 1972, 47-12192; Apr. 20, 1973, 48-45546
Int. Cl.² A23L *1/20*
U.S. Cl. 426—46 25 Claims

1. A method for elimination of a bean odor from a soy milk which comprises subjecting the soy milk containing added saccharide to lactic fermentation until the acidity thereof is not more than 4 and then distilling the resulting fermented soy milk at a temperature of 10° to 85°C. under a pressure of not more than 500 mmHg.

3,937,844

PROCESS FOR PRODUCING PROCESSED LOW SALT SOYBEAN PASTE

Masakuni Koyama, Tokyo, Japan, assignor to Shinshu Miso Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 534,863
Int. Cl.² A23L *1/204*
U.S. Cl. 426—46 4 Claims

1. In a process for producing a fermented miso soybean paste including the steps of:

a. fermenting an aqueous cooked paste containing soybeans with yeast in the presence of salt, and

b. brewing and ripening the paste,

the improvement comprising adding from 0.05–0.5% lactic acid to the soybean paste at the initiation of fermentation step (a) thereby lowering the pH of the paste and maintaining the fermentation at a temperature of 15°–35°C thereby producing a soybean paste having a salt content less than 10% and devoid of deterioration.

3,937,845

SEMI-SOLID FERMENTATION OF STRAW

Youn W. Han, and Arthur W. Anderson, both of Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 8, 1975, Ser. No. 539,552
Int. Cl.² A23K *1/00*
U.S. Cl. 426—53 6 Claims

1. A process for increasing the digestibility and protein content of straw, which consists of

a. mixing 1 part of straw with about 2 to 4 parts of aqueous sulphuric acid having a normality of about 0.1 to 1, and holding the mixture at about 100° to 125° C. for about 30 to 60 minutes,

b. adding to the acid-treated straw an amount of ammonia to provide a pH of about 4.0–4.5,

c. aerobically fermenting the ammoniated acid-treated straw, which is a moist fibrous mass having a solids content of about 20–33% and a moisture content of about 80–67%, with a microorganism selected from the group consisting of *Candida utilis*, *Pullularia pullulans*, and *Trichoderma viride*, at a temperature of about 30° C. for a period of about 1 to 7 days, and

d. drying the so-fermented product.

3,937,846

PROCESSES FOR PREPARING NUTRITIONAL COMPOSITIONS FOR ANIMAL FEEDS

Raymond Teissier, Versailles; Jean Louis Colas, Saint-Maurdes-Fosses, and Dominique Taisne, Paris, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed June 2, 1975, Ser. No. 582,632
Claims priority, application France, June 6, 1974, 74.19514
Int. Cl.² A23K *1/22*
U.S. Cl. 426—69 14 Claims

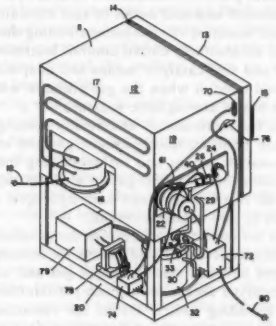
1. A process for preparing nutrient compositions for feeding animals which comprises preparing a dry mixture containing 35 to 48 parts of urea with 65 to 52 parts of urea phosphate, melting the urea-urea phosphate mixture so obtained at a temperature of from 72° to 90°C, absorbing the molten mixture in an animal feed material, and cooling the feed material containing the mixture.

3,937,847

METHOD OF AND MEANS FOR PRESERVING PERISHABLE FOODSTUFFS

William Elkins, 7081 Galli Drive, San Jose, Calif. 95127; Harold H. Kuehn, 1760 Los Altos Drive, San Mateo, Calif. 94402, and Richard H. Chamberlin, 273 Cypress Ave., San Bruno, Calif. 94066

Filed Aug. 2, 1974, Ser. No. 494,194
Int. Cl.² A23L *3/00*
U.S. Cl. 426—231 15 Claims



1. The method of preserving foodstuffs comprising the steps of:

a. placing said foodstuffs in a container of air at atmospheric pressure that may be selectively sealed substantially air-tight;

b. sealing said container substantially air-tight with said foodstuffs therein and establishing air flow of given time rate through said container by means of a substantially closed circuit system external to said container and including a gas pump, said conduit having its inlet and outlet coupled to said container at spaced locations;

c. generating hydrogen gas at a given time rate less than 40% of said given time rate of air flow for a given predetermined length of time and introducing said hydrogen gas into said substantially closed conduit system at a point in said conduit system intermediate said gas pump and said outlet of said conduit;

d. reacting said hydrogen gas with the oxygen in said air flow in a catalytic means interposed in said substantially closed conduit intermediate said point of introduction of said hydrogen gas and said outlet of said substantially closed conduit;

e. admitting air into said substantially closed conduit system intermediate said gas pump and said catalytic means

during operation in an amount just sufficient to maintain substantially atmospheric pressure in said container and said conduit system;

f. thermally or electrically sensing the level of reaction of said hydrogen gas with said oxygen in said catalytic means;

g. after the end of said predetermined length of time, decreasing said given time rate of generation of said hydrogen gas in a direct relation to said level of reaction of said hydrogen gas with said oxygen in said catalytic means; and

h. restarting said predetermined length of time each time said container is opened and subsequently substantially resealed after a prior said predetermined length of time.

8. Apparatus for preserving foodstuffs comprising:

a. means defining a container for a given volume of air at atmospheric pressure including means for selectively sealing said container substantially air-tight;

b. means establishing air flow of given time rate through said container including a gas pump interposed in a substantially closed conduit having its inlet and outlet communicating with said container at spaced locations;

c. means for generating hydrogen gas at a given time rate less than 40% of said given time rate of air flow during a given predetermined length of time and for introducing said hydrogen gas into said substantially closed conduit system at a point in the conduit intermediate said gas pump and said outlet of said substantially closed conduit;

d. catalytic means for reacting said hydrogen gas with the oxygen in said air flow interposed in said conduit intermediate said point of introduction of said hydrogen gas into said conduit and said outlet of said conduit;

e. pressure sensitive valve means extending through the wall of said substantially closed conduit intermediate said gas pump and said catalytic means and adapted to admit air into said conduit when the gas pressure within said conduit is below atmospheric pressure;

f. means for thermally or electrically sensing the level of reaction between said hydrogen gas and said oxygen in said catalytic means and for decreasing the time rate of generation of hydrogen gas in a direct relation to said level of reaction between said hydrogen gas and said oxygen in said catalytic means;

g. means for operating said means for generating hydrogen gas independently of said means for sensing the level of reaction between said hydrogen gas and said oxygen in said catalytic means for a given predetermined length of time including switch means for restarting said given predetermined length of time upon opening and subsequent closure of said means for selectively sealing said container substantially air-tight after the end of a prior said given predetermined length of time.

3,937,848

CHIP FRACTURING FROM A FRIED RIBBON

Glenn M. Campbell, Minneapolis, and Stanley G. Liedman, Anoka, both of Minn., assignors to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 27, 1973, Ser. No. 355,231
Int. Cl.² A23L *1/01*
U.S. Cl. 426—439 **9 Claims**

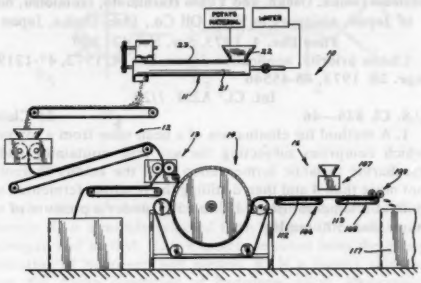
1. A process for preparing a chip snack comprising:

preparing a dough by mixing a starchy food material and water, said dough having high enough moisture content to provide the dough with sufficient cohesiveness to permit sheeting of the dough and less than that amount of moisture that would cause the dough to be adhesive and stick to equipment, the moisture content of said dough being about 25 to 45 percent by weight;

sheeting the dough;

cutting the sheeted dough into a ribbon having alternating wide portions and narrow portions;

frying the ribbon in an oil bath, said ribbon extending from the point at which said ribbon enters the bath to the point at which the ribbon exits the frying bath; and



then fracturing the ribbon at said narrow portions, said fracturing taking place at least 5 seconds after the ribbon has exited said bath, said ribbon having become friable, thereby separating the fried ribbon at the narrow portions into individual chips.

3,937,849

PROCESS FOR IMPROVING THE DIGESTIBILITY OF HEMICELLULOSE-FREE STRAW

Youn W. Han, Corvallis, Oreg.; James W. Pence, El Cerrito, Calif., and Arthur W. Anderson, Corvallis, Oreg., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 23, 1975, Ser. No. 543,707
Int. Cl.² A23K *1/18*
U.S. Cl. 426—442 **3 Claims**

1. A process for improving the digestibility of hemicellulose-free straw, which comprises

a. soaking the hemicellulose-free straw for about one hour at room temperature in dioxane containing about 1 to 2% HCl, the amount of dioxane being enough to completely immerse the straw therein,

b. removing dioxane and HCl from the so-treated straw by washing it with hot water, and

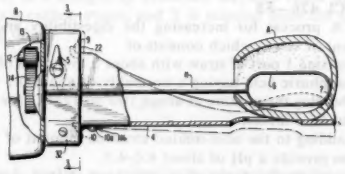
c. drying the treated and washed straw.

3,937,850

METHOD OF HOLLOWING OUT AN ARTICLE OF FOOD

Bahia Rashid Farha, and Lloyd Lee, both of Charlton Heights, W. Va., assignors to Bahia Rashid Farha, Charlton Heights, W. Va.

Division of Ser. No. 212,943, Dec. 28, 1971, Pat. No. 3,780,435. This application Oct. 4, 1973, Ser. No. 403,575
Int. Cl.² A23P *1/00*
U.S. Cl. 426—484 **1 Claim**



1. A method of hollowing out an article of food such as a fruit or vegetable having a longitudinal axis and two end areas to provide a shell of substantially, uniform thickness, comprising;

rotating a knife about its axis, guiding one of said end areas of said article of food against said rotating knife with a

curved guide member loosely supporting said article of food for (1) rotation about said longitudinal axis and (2) translation in a direction substantially parallel to said longitudinal axis, relatively rotating said knife and said article of food with respect to each other about said longitudinal axis of said article of food while the guide maintains said knife a predetermined distance from the surface of said article of food and while simultaneously advancing said knife into said article of food in the longitudinal direction to a point short of the other end area of said article of food, thereby forming a shell of substantially uniform thickness and removing an inside area of the article of food which is greater than the cross-sectional area of the knife.

3,937,851

ZONED COLORATION

Nicolo Bellanca, and Thomas Edward Furia, both of San Jose, Calif., assignors to Dynapol, Palo Alto, Calif.

Filed Apr. 15, 1974, Ser. No. 460,908
Int. Cl.² A23L *1/275*
U.S. Cl. 426—540 **6 Claims**

1. A multicolored composition comprising a plurality of zones of viscoelastic edible substance, said zones containing different effective coloring amounts of polymeric dye of a molecular weight of from 2000 to 400,000, said dye being represented by the structural formula selected from the formulae —(Ch B)$_n$
and

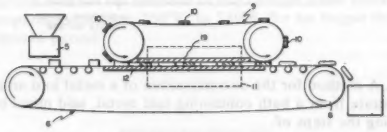
wherein n is an integer greater than 1, Ch is an organic chromophore and B is a non-chromophoric organic linking group, and said zones thereby differing in color from one another.

3,937,852

PROCESS FOR BAKING A COMPRESSED CRACKER

Irwin Wolf, 105 Rogers Drive, New Rochelle, N.Y. 10804

Filed July 5, 1973, Ser. No. 376,598
Int. Cl.² A21D *8/06*
U.S. Cl. 426—560 **1 Claim**



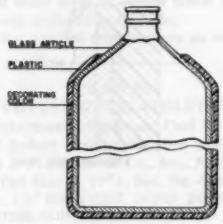
1. A process for preparing a baked cracker which comprises compressing between two surfaces at a distance of about one-eighth to one-sixteenth of an inch a quantity of bakable dough having a rubbery consistency which tends to resume its original shape when free of compressive forces and wherein said dough consists essentially of wheat flour, and wherein a few percent of said wheat flour is replaced by a few percent of soy or cottonseed flour, vegetable or cooking oil, or an equivalent amount of hydrogenated vegetable shortening and water between two surfaces, present in amounts in said dough in the ratio of 3½ cups to 5 cups wheat flour to 3 to 4 ounces oil to 3½ to 4½ ounces water, and baking said dough while it is compressed between said surfaces.

3,937,853

METHOD OF MAKING A COLOR DECORATED, PLASTIC COATED GLASS ARTICLE

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed July 12, 1973, Ser. No. 378,493
Int. Cl.² B05D *1/06, 1/24*
U.S. Cl. 427—29 **18 Claims**



1. A method of permanently decorating a glass container comprising,

applying to an outside surface region of a preformed glass container a glass decorating color which requires heating to a temperature higher than about 150° F. to bond permanently to the glass surface,

then, prior to heating said container with the said decorating color thereon to a temperature effective for such permanent bonding to occur, coating a finely divided heat settable plastic onto said glass container, the said plastic being coated over the applied color and extending on said glass surface beyond the surface region on which said color has been applied,

then anchoring said plastic to said glass container by heating the decorated and thus coated container to set the plastic so that it forms a smooth continuous film,

and cooling the container,

the resultant plastic film being supported by and anchored to the surface of said glass container at least over the region beyond that covered by the said decorating color,

thereby producing a final permanently decorated glass container wherein said film provides a permanent outer covering over said decorating color which encloses and protects the latter on the glass surface, the decorating color being captured between the film and the glass surface and not extending to the outside surface of said film.

3,937,854

METHOD OF MAKING A THERMOPLASTIC INK DECORATED, POLYMER COATED GLASS ARTICLE

Herbert C. Shank, Jr., Lancaster, Ohio, assignor to Anchor Hocking Corporation, Lancaster, Ohio

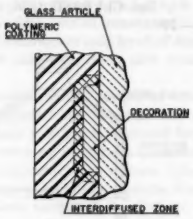
Continuation-in-part of Ser. No. 378,493, July 12, 1973. This application Feb. 7, 1974, Ser. No. 440,331
Int. Cl.² B05D *1/06, 1/24*
U.S. Cl. 427—29 **17 Claims**

1. A method for decorating a previously formed article of glassware, comprising,

applying to a glass surface area of the previously formed article a decoration of a thermoplastic ink which is solid at room temperature but which becomes semi-fluid upon heating, said ink being applied by silk screening it onto the article at a temperature at which the ink is semi-fluid, the article being at a lower temperature at which the ink solidifies rapidly on the glass surface area, when it contacts the article,

coating a layer of finely divided polymeric coating material onto the decorated article and over the ink thereon, said coating material being a resin which is fusible at a temperature above the temperature at which the ink becomes semi-fluid,

heating the article with the ink decoration and resin layer thereon to a temperature at which the ink again becomes semi-liquid and the resin fuses to form a smooth continuous protective film on said article and melt-unites to said decoration,

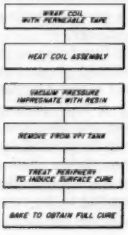


and cooling the coated, decorated article, thereby providing a final decorated article of glassware wherein said film provides a permanent outer coating which covers and protects said decoration on said glass surface area, the decoration being in solid but thermoplastic remeltable condition under the said outer coating.

3,937,855
METHOD OF CURING VACUUM PRESSURE IMPREGNATED COILS

Geza Gruenwald, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed June 21, 1974, Ser. No. 481,900
Int. Cl.[2] B05D *3/06*; H01F *5/06*
U.S. Cl. 427—54 **8 Claims**


WRAP COIL WITH PERMEABLE TAPE
HEAT COIL ASSEMBLY
VACUUM PRESSURE IMPREGNATE WITH RESIN
REMOVE FROM VPI TANK
TREAT PERIPHERY TO INDUCE SURFACE CURE
BAKE TO OBTAIN FULL CURE

1. A method of insulating an electro-magnetic coil comprising the steps of:

a. applying a permeable electrical insulating material to the coil;

b. applying a first chemical catalyst throughout said material, said chemical catalyst being reactive with a resin at elevated temperatures but relatively unreactive therewith at room temperatures;

c. vacuum pressure impregnating said material throughout with a liquid, chemically reactive, cross linkable resin;

d. thereafter inducing a quick cure to solidify said resin on the surface of said impregnated material, thereby encapsulating the liquid resin which is in the bulk of said material; and

e. subsequently exposing said material to elevated temperatures to cure said liquid resin and thereby form a solid structure throughout said material.

4. A method of insulating an electro-magnetic coil as set forth in claim 1 wherein the step of inducing curing is accomplished by applying to the surface of the impregnated material a highly reactive chemical cross linking agent.

6. A method of insulating an electro-magnetic coil as set forth in claim 1 wherein the step of inducing curing is accomplished by the ultra-violet irradiation of the outer surface of the impregnated material.

3,937,856
REHABILITATION OF WATER-DAMAGED ELECTRICAL EQUIPMENT

Edward M. Geiser, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

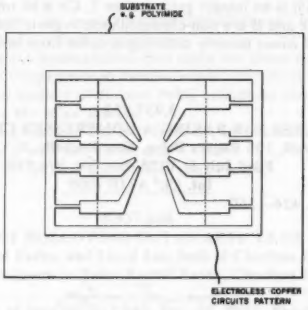
Filed Nov. 16, 1973, Ser. No. 416,548
Int. Cl.[2] B23P *7/00*
U.S. Cl. 427—58 **10 Claims**

1. A method for the rehabilitation of water-damaged electrical equipment which comprises treating said equipment with a bath consisting essentially of an inert organic solvent, a paraffinic oil having a Saybolt Universal Second value of from 90 to 110 at 100°F., a polymethyl aromatic compound, and a salt selected from the group consisting of the reaction product of N-propyl-1, 3-propylenediamine with malonic acid, N-n-amyl-1, 3-propylenediamine with acetylene dicarboxylic acid, and N-n-butyl-1, 6-hexylenediamine with oxalic acid, and removing the resultant rehabilitated equipment from said bath.

3,937,857
CATALYST FOR ELECTROLESS DEPOSITION OF METALS

Charles Roscoe Brummett, Harrisburg; Ray Ned Shaak, Lebanon, and Daniel Marshall Andrews, Harrisburg, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed July 22, 1974, Ser. No. 490,817
Int. Cl.[2] B05D *5/12*
U.S. Cl. 427—98 **20 Claims**



1. A method for the decomposition of a metal into an inert substrate from a bath containing said metal, said metal comprising the steps of:

applying to said substrate a thin film of a thermally decomposable complex of palladium or platimum having the formulae

LmPdXn or

LmPtXn wherein

L is a ligand or an unsaturated organic group; Pd or Pt is palladium or platinum metal; X is a halide, an alkyl group or a bidentate ligand;.and *m* is from 1 to 4 and *n* is from 0 to 3;

exposing said substrate to which said complex has been applied to heat at a temperature of about 300°C and less to effect decomposition of said complex and to create a residue catalytic to a metal in an electroless bath solution; and

depositing a metal from said electroless bath on said substrate in an area rendered catalytic by decomposition of said complex.

3,937,858
METHOD OF AND BATH FOR THE PLATING OF ALUMINUM OR AN ALUMINUM ALLOY ON A METALLIC SUBSTRATE

Wolfgang Thiele, Bad Homburg, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 13, 1974, Ser. No. 441,967
Claims priority, application Germany, Feb. 20, 1973, 2308281
Int. Cl.² C23C *1/00*
U.S. Cl. 427—431 **7 Claims**

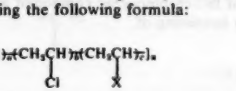
1. A hot dip method of producing an aluminum-alloy coating comprising the steps of immersing a metallic substrate into a bath of molten aluminum-alloy consisting essentially of 0.005 to 1.0% by weight of strontium and/or 0.01 to 5.0% by weight antimony balance aluminum and metallic impurities due to the producing process, for a period sufficient to deposit an aluminum-alloy coating on said substrate.

3,937,859
INTERLINING MADE OF A THERMOPLASTIC AND THERMOSETTING RESIN COMPOSITION

Mark Ernest Carra, Springfield, and Louis Albert Manrique, Jr., Chicopee, both of Mass., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Apr. 12, 1974, Ser. No. 460,659
Int. Cl.² B32B *3/02*, *7/14*
U.S. Cl. 428—194 **8 Claims**

1. A fusible interlining comprising a fabric carrying a coating of a thermoplastic-thermosetting composition consisting of a terpolymer having the following formula:



where R is selected from the group consisting of ethylene, propylene and butylene, *a* and *b* are substantially equal, *a* plus *b* equals 20c, x is a radical selected from the group consisting of $CONH_2$ and COOH, *n* is an integer of from 100 to 300, and an aminoplast whereby the coating will soften and become adhesive at elevated temperatures of about 150°F. and will cross-link without the addition of any catalyst when heated to a temperature of from 250°F. to 350°F. for no longer than a 12 second period.

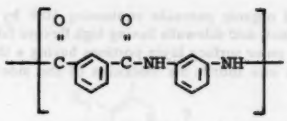
3,937,860
FILTRATION MATERIAL

Irwin J. Gusman, Great Neck, N.Y., and Carlo Strack, Wyckoff, N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed Apr. 23, 1975, Ser. No. 570,698
Int. Cl.² B32B *17/06*
U.S. Cl. 428—228 **6 Claims**

1. A high temperature resistant filtration material comprising:

a. Two outer layers of nonwoven fabric of fibers of an aromatic polyamide having repeating units of the formula



b. A first inner layer of nonwoven fabric of glass fibers, and

c. A second inner layer of woven fabric made of yarns of glass or said aromatic polyamide,

said layers being needled together into an integral structure.

3,937,861
FLOOR COVERING FOR ATHLETIC FACILITY

Joseph L. Zuckerman, Livingston; Carl R. Eckardt, Morris Plains, and Robert V. Bertotti, New Milford, all of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Filed May 6, 1974, Ser. No. 466,921
Int. Cl.² B32B *5/02*, *29/00*; D03D *3/00*
U.S. Cl. 428—235 **6 Claims**

1. A multilayer product suitable for use as a floor covering of an athletic facility comprising a composite needlepunched material having a fiber batt bottom layer at 10 to 80 ounces per square yard needled into a support layer of fabric or film so that a minor portion of the fiber batt protrudes through the top of said support layer and a major portion of the fiber batt remains as a fibrous layer at least 1/16 inch thick attached to the bottom of said support layer; a layer of polyurethane elastomer of from 3/64 inch to ⅜ inch thick adhered to the top of said composite needlepunched material, said polyurethane elastomer having a Shore A hardness of 30 to 90, a resilience of 20 to 50 percent rebound, a compression set of not greater than 35 percent, an ultimate elongation of at least 80 percent, an ultimate tensile strength of at least 200 p.s.i., a density of 0.5 to 1.6 gm./cm.³ and a tear strength of at least 50 p.l.i.; and a wear coating of polyurethane having a high abrasion resistance adhered to the top of said layer of urethane elastomer said wear coating providing said multilayer product with a smooth surface.

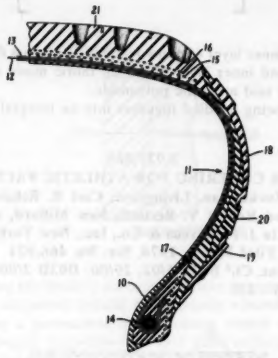
3,937,862
PNEUMATIC TIRES

Jean-Paul Dillenschneider, Beaumont, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France

Continuation of Ser. No. 255,615, May 22, 1972, abandoned. This application June 14, 1974, Ser. No. 479,275
Claims priority, application France, June 2, 1971, 71.20047
Int. Cl.² B32B *25/16*
U.S. Cl. 428—409 **7 Claims**

1. A radial carcass tire whose sidewalls are formed, at least on the outer surface layer thereof, of at least one surface layer mixture comprising nonhalogenated elastomers both of the diene type selected from the group consisting of natural rubber, polybutadiene, polyisoprene, styrene-butadiene copolymer and transpolypentene mixed with an ethylene-propylene type selected from the group consisting of ethylene-propylene copolymer and ethylene-propylene-diene terpolymer containing on the order of 5% diene, characterized by the fact that the outer surface layer portions of the sidewalls formed of said mixes are vulcanized by means of an organic peroxide, the amount of organic peroxide used being from about 1 to about 10 parts by weight per 100 parts by weight of elastomers of a

commercial organic peroxide containing 40% by weight of active product, said sidewalls having high flexure fatigue resistance, said outer surface layer portions having a thickness at least about one fourth the thickness of the sidewalls, said



mixture containing from about 30 to about 65 parts by weight of carbon black per 100 parts by weight of elastomers, and the amount of said elastomer of the ethylene-propylene type used being between about 15% and about 60% by weight of the total of the elastomers.

3,937,863

PRESSURE POLISHED EXTRUDED POLYCARBONATE SHEET

Richard E. Moore, R.D. 1, Locust Grove Road, West Chester, Pa. 19380

Continuation-in-part of Ser. No. 232,725, March 8, 1972, Division of Ser. No. 54,185, July 13, 1970, Pat. No. 3,681,483. This application Dec. 6, 1974, Ser. No. 530,067

Int. Cl.[2] 428 *910, 918;* **B29C** *25/00;* **B29D** *11/00*

U.S. Cl. 428—410 **9 Claims**

1. A sheet of extruded unfilled transparent polycarbonate having opposed pressure polished mirror finished substantially parallel surfaces which are substantially free of ripples, wiggles, extrusion die lines and stresses and whose percent luminous transmittance is greater than, its percent haze less than and its distortion less than the as extruded sheet of the same thickness, said pressure polished sheet having a thickness of about 0.040 inch, a luminous transmittance of about 87.5% to 95.4% and a haze of about 1.68% to 2.74%, said sheet being made by first preheating the as extruded sheet between a pair of mirror polished plates at a pressure of zero to a maximum of 50 psi to the heat distortion temperature of the sheet to expel air entrapped between the sheet and the plates, then increasing the pressure to about 300 to 500 psi while allowing the temperature to rise to about 310°–330°F to transfer the mirror finish of the plates to the sheet surfaces while substantially eliminating the ripples, wiggles and extrusion die lines and stresses, and then cooling the sheet while reducing the pressure to fix the mirror finish in the sheet surfaces as the sheet contracts and solidifies.

9. A sheet of extruded unfilled transparent polycarbonate having opposed pressure polished mirror finished substantially parallel surfaces which are substantially free of ripples, wiggles, extrusion die lines and stresses and whose percent luminous transmittance is greater than, its percent haze less than and its distortion less than the as extruded sheet of the same thickness, said pressure polished sheet having a thickness of about 2.0 inches, a luminous transmittance of about 40.1% and a haze of about 30.9% to 34.4%, said sheet being made by first preheating the as extruded sheet between a pair of mirror polished plates at a pressure of zero to a maximum of 50 psi to the heat distortion temperature of the sheet to expel air entrapped between the sheet and the plates, then increasing the pressure to about 300 to 500 psi while allowing the temperature to rise to about 310°–330°F to transfer the mirror finish of the plates to the sheet surfaces while substantially eliminating the ripples, wiggles and extrusion die lines and stresses, and then cooling the sheet while reducing the pressure to fix the mirror finish in the sheet surfaces as the sheet contracts and solidifies.

3,937,864

HEAT-SENSITIVE RECORDING SHEETS HAVING IMPROVED STABILITY

Isao Kohmura, and Kiyoshi Futaki, both of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sept. 4, 1973, Ser. No. 394,012

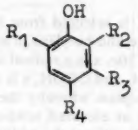
Claims priority, application Japan, Sept. 4, 1972, 47-87944

Int. Cl.[2] B41M *5/00*

U.S. Cl. 428—411 **4 Claims**

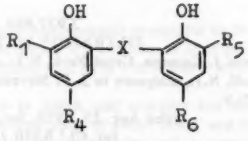
1. Heat-sensitive recording sheets having an improved stability comprising a colorless or pale-colored chromogenic compound and an organic acid for coloring said chromogenic compound by heating, which contain at least one phenol derivative different from said chromogenic compound and said organic acid, which phenol derivative is present in an amount of 10 to 500 wt % based on the weight of chromogenic compound and increases the stability of the colored reaction product of the chromogenic compound and is selected from the group consisting of

(Formula I)



(wherein R_1 represents a branched alkyl group having 3 to 8 carbon atoms, R_2 and R_3 represent each a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and R_4 represents a hydroxyl group, an alkyl group having 1 to 8 carbon atoms or an alkoxy group),

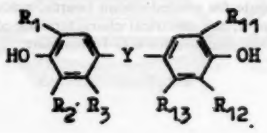
(Formula II)



(wherein R_1 and R_5 represent each a branched alkyl group having 3 to 8 carbon atoms, R_4 and R_6 represent each an alkyl group having 1 to 8 carbon atoms, and X represents S, O, SO_2, S_2 or

wherein *n* is an integer of 0 to 3, and R_7 and R_8 represent each a hydrogen atom or an alkyl group having 1 to 8 carbon atoms or R_7 and R_8 form a cyclopentamethylene group by binding together)

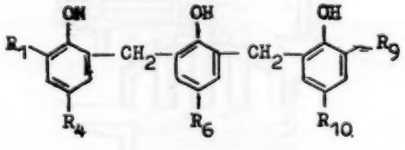
(Formula III)



(wherein R_1 and R_{11} represent each a branched alkyl group having 3 to 8 carbon atoms, R_2, R_3, R_{12} and R_{13} represent each a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and Y represents S, O, SO_2, S_2 or

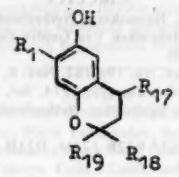
wherein *m* represents an integer of 0 to 3, and R_{14} and R_{15} each represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, or R_{14} and R_{15} form a cyclopentamethylene group by binding together),

(Formula IV)



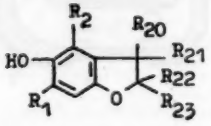
(wherein R_1 and R_9 represent each a branched alkyl group having 3 to 8 carbon atoms, and R_4, R_6 and R_{10} represent each an alkyl group having 1 to 8 carbon atoms),

(Formula V)



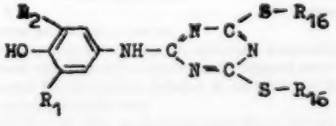
(wherein R_1 represents a branched alkyl group having 3 to 8 carbon atoms, R_{17} represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms, and R_{18} and R_{19} represent each an alkyl group having 1 to 8 carbon atoms),

(Formula VI)



(wherein R_{20}, R_{21}, R_{22} and R_{23} represent each a hydrogen atom or an alkyl group having 1 to 18 carbon atoms, and R_1 represents a branched alkyl group having 3 to 8 carbon atoms, R_2 represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms), and

(Formula VII)



(wherein R_1 and R_2 represent each a branched alkyl group having 3 to 8 carbon atoms, and R_{16} represents an alkyl group having 1 to 18 carbon atoms).

3,937,865

REINFORCED PLASTICS CARRIER FOR PRINTED CIRCUITS

Hendrik Jongetjes, Heemskerk, Netherlands, assignor to Koninklijke Papierfabrieken Van Gelder Zonen N.V., Amsterdam, Netherlands

Continuation of Ser. No. 196,782, Nov. 8, 1971, abandoned. This application Jan. 25, 1974, Ser. No. 436,669

Claims priority, application Netherlands, Nov. 11, 1970, 7016489

Int. Cl.[2] B32B *17/04*; D21H *5/18*

U.S. Cl. 428—413 **4 Claims**

1. A process for making an insulating sheet for printed circuits, which comprises the steps of forming a 0.005–0.05% suspension of fibers and particulate binder in water, said fibers being fibers of E glass 5–30 mm long and 5–15 μ thick and said binder being a particulate polyvinyl alcohol having a degree of hydrolization of 98–100%, being present in the amount of 5–25% based upon weight of the glass fibers, said binder having a particle size of 50–180 mμ and a degree of swelling of 20°C of 3–8, and having a viscosity measured as a 4% solution in water at 20°C. of 20–100 cP; processing this suspension on a fiber web making machine by dewatering to form a non-woven glass fiber web; drying said glass fiber web by heating to a temperature of 85°–100°C to dissolve the polyvinylalcohol granules in their own swelling water and subsequently further heating to an increased temperature to evaporate the water and dehydrate and harden the polyvinyl alcohol; impregnating a plurality of said glass fiber webs with a solution of an epoxy resin and hardener in acetone, evaporating the acetone; arranging said plurality of webs as a laminate; and compressing said webs into an insulating sheet laminate at elevated pressure and temperature.

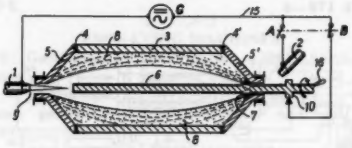
3. A laminate for printed circuit boards, made by the process of claim **1**, the electrical characteristics of which fully satisfy the DIN standard for a G-10 laminate.

3,937,866

PROCESS OF STRIKING AN ARC FOR A PLASMA BEAM INSIDE AN ENCLOSURE AND A STICK-ELECTRODE FOR CARRYING OUT THE PROCESS

Jean Albert Sunnen, and Henry Rene Schoumaker, both of Brussels, Belgium, assignors to La Soudure Electrique Autogene, Procedes Arcos, Anderlecht, Belgium

Filed Sept. 3, 1974, Ser. No. 502,825
Claims priority, application Belgium, Oct. 17, 1973, 136776
Int. Cl.[2] H05H *1/26*
U.S. Cl. 13—9 R 2 Claims



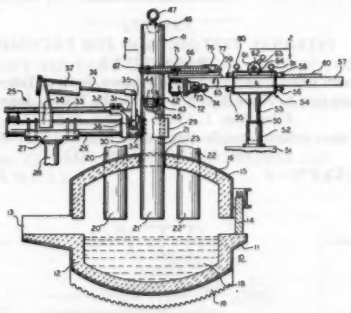
1. A process of striking a plasma beam at high temperature, which is practiced in an enclosure with two torches having nozzles and located at opposite ends of the said enclosure and outside said enclosure and windows associated with the torches, which comprises introducing a stick-electrode lengthwise through the window associated with one of the torches and brought near the opposite torch until the plasma hooks to the stick-electrode, thereby closing between the nozzle of the one torch and the stick-electrode a circuit of superimposed current, pulling the stick-electrode out progressively from the enclosure, carrying with it the plasma beam until it meets with a second torch which is energized at the very moment the extraction of the stick-electrode is completed, in order to transfer the superimposed current to its nozzle, and disconnecting the stick-electrode and closing the laminar plasma flow circuit.

3,937,867

COUPLER FOR ELECTRIC FURNACE ELECTRODES

Peter J. Wynne, Pittsburgh, Pa., assignor to Lectromelt Corporation, Pittsburgh, Pa.

Filed Sept. 23, 1974, Ser. No. 508,510
Int. Cl.[2] H05B *7/10*
U.S. Cl. 13—18 23 Claims



1. A device for coupling a new furnace electrode section to another electrode section previously operatively associated with said furnace comprising:

a. a flexible means for being formed into a loop to enclose at least one of said electrode sections and to dispose at least a portion of said flexible means in gripping engagement with at least a portion of the periphery of one electrode section, and

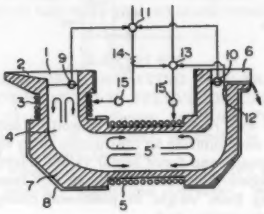
b. means for translating said flexible means to effect turning of said at least one electrode section when said flexible means is in gripping engagement therewith.

3,937,868

INDUCTION MELTING FURNACE

Ryuichi Nakagawa; Shiro Yoshimatsu, both of Tokyo; Akira Fukuzawa, Yokohama; Akira Sato, Omiya; Tatsuro Mitsui, Sagamihara; Takuya Ueda, Zushi, and Tsuyosho Ozaki, Tokyo, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Division of Ser. No. 404,901, Oct. 10, 1973. This application June 28, 1974, Ser. No. 484,153
Claims priority, application Japan, Oct. 11, 1972, 47-101125
Int. Cl.[2] H05B *5/16*
U.S. Cl. 13—26 3 Claims



1. An induction melting furnace for melting unmelted material introduced therein into molten metal already in the furnace, comprising:

a material charging section having an auxiliary induction coil, said auxiliary induction coil promoting melting of the material by induction heating of the material while in the material charging section;

a main melting section having a main induction coil for melting metal in the main melting section by induction heating;

a molten metal effluent section;

means for measuring the temperature of the metal at the molten effluent section; and

means for regulating power supplied to the induction coil of the melting section according to the temperature measured at the molten metal effluent section, to thereby control the temperature of the molten metal effluent.

3,937,869

FORCE SENSING CONTROL APPARATUS AND METHOD FOR ELECTRIC ARC FURNACES

Kegham M. Markarian, University Heights, and Thomas M. Maloney, Cleveland, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Oct. 8, 1974, Ser. No. 513,124
Int. Cl. H05b *7/00*
U.S. Cl. 13—13 17 Claims

1. In an electric arc furnace system:

a. an electrode system comprising an electrode projecting into a furnace along an axis and electrode support structure supported for movement relative to said furnace in directions parallel to said axis;

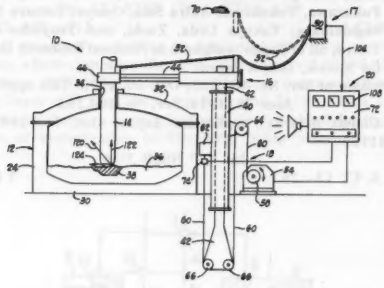
b. drive means for movably positioning said electrode system relative to said furnace;

c. force sensing means cooperating with said electrode system for detecting changes in forces applied to said

electrode system, said force sensing means producing force signals which vary as a function of changes in the direction, magnitude and rate of change of magnitude with respect to time of the components of detected force changes acting parallel to said axis; and,

d. force responsive control means for said drive means, said force responsive control means comprising:

i. discriminating means for discriminating between force signal values having at least a predetermined rate of



change with respect to time caused by said electrode system encountering an obstruction to its movement in said furnace and force signal values having less than said predetermined rate of change with respect to time resulting from weight or positional changes of said electrode system; and,

ii. control signal means for producing an output control signal for terminating operation of said drive means when said discriminating means detects a force signal caused by an obstruction.

3,937,870

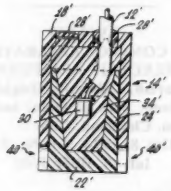
DEVICE FOR INSULATING AN ELECTRICAL WIRE JOINT

John Bumpstead, Glendora, and Robert B. Costa, Covina, both of Calif., assignors to Clemar Manufacturing Corporation, Glendora, Calif.

Continuation-in-part of Ser. No. 495,878, Aug. 8, 1974, abandoned, which is a continuation of Ser. No. 322,851, Jan. 11, 1973, abandoned. This application Mar. 18, 1975, Ser. No. 559,429

Int. Cl.² H02G *15/08*

U.S. Cl. 174—87 **11 Claims**



1. In a device protecting the joined ends of two or more electrical conductors, and which includes a tubular casing having a side wall, an end wall, and an open end, and a closure member assembled with the casing and having an end wall closing the open end of the casing and defining therewith an internal space, at least two passageways through one of the end walls to the internal space, at least two conductors projecting through the passageways and electrically joined within the internal space, and a bonding compound disposed within the internal space, the improvement comprising:

a plurality of generally radially inwardly extending flexible tabs disposed on the inner sidewalls of said passageways centering and holding the electrical conductors and substantially impeding the flow of uncured bonding compound out of said internal space.

3,937,871

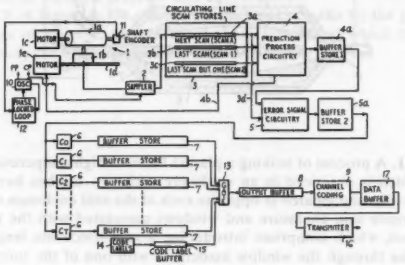
CODE COMMUNICATION

Alfred Henry Robinson, London, England, assignor to International Publishing Corporation Limited, London, England

Filed Mar. 26, 1973, Ser. No. 344,765

Int. Cl.² H04N *7/12*; H03K *13/22*

U.S. Cl. 178—6 **3 Claims**



3. A method of code communication for a source of message symbols, comprising the steps of:

accepting successive groups of message symbols from said source,

predicting from said accepted groups the positions of transitions of signal level in a succeeding group of message symbols by using a polynomial curve fitting procedure to fit polynomial curves to transitions of signal level in at least one preceding group of message symbols, said positions of transitions of signal level being predicted to lie on said curves fitted to said transitions,

generating an error signal corresponding to the difference between said succeeding group of message symbols and the prediction of said following group of message symbols,

and coding the error signal for transmission to a receiving device.

3,937,872

INTERNAL TEST METHOD FOR FACSIMILE TRANSCEIVER

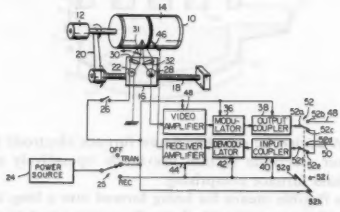
Mitsuru Kondo, and Toshihiko Misawa, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed May 1, 1974, Ser. No. 465,793

Claims priority, application Japan, May 8, 1973, 48-50951

Int. Cl.² H04N *1/06*, *1/32*

U.S. Cl. 178—6 **10 Claims**



1. A method of testing a facsimile transceiver having a

transmitter section with a light source to illuminate the copy and a receiver section, the method comprising the steps of:

energizing both the transmitter section and the receiver section;

connecting the output of the transmitter section to the input of the receiver section; and

varying the intensity of the lights source; whereby

the correlation between the pattern produced by the receiver section and the variation in intensity of the light source is an indication of the normality of operation of the transceiver.

3,937,873

ENGRAVING MACHINES

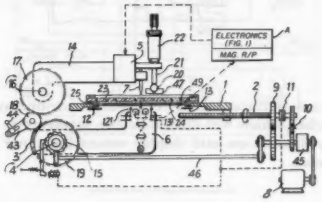
Paul E. Gastineau, 24 rue Mansart, 22000, Saint-Brieuc, France

Filed Apr. 22, 1974, Ser. No. 463,064

Claims priority, application France, Apr. 25, 1973, 73.14912

Int. Cl.[2] H04N *1/10, 1/24*

U.S. Cl. 178—6.6 B **25 Claims**



1. A method of automatically forming watermark engravings, in which an optical reading head is coupled with an engraving head provided with an oscillating stylet which are both moved with a longitudinal scanning motion combined with an intermittent transverse motion respectively relative to a model and a plate to be engraved which are in fixed relative position, wherein the maximum amplitude of oscillation of the stylet is of the order of 3 to 4 mm and engraving is effected in successive identical passes, the distance between the engraving head and the plate being decreased progressively in successive stages by a maximum depth of the order of 0.2 mm.

3,937,874

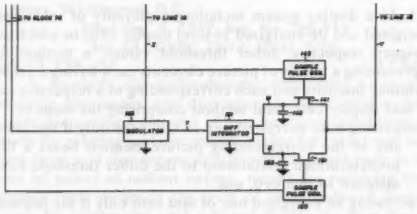
OFFSET VOLTAGE CORRECTION CIRCUIT FOR MULTIPLE VIDEO CHANNEL IMAGER

Joseph Carbone, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Jan. 9, 1975, Ser. No. 539,897

Int. Cl.[2] H04N *3/16*; H01L *29/78*; H03B *1/00*

U.S. Cl. 178—7.1 **16 Claims**



1. An imaging system comprising

a. a two-dimensional array of sensing sites of MIS cell pairs, said sensing sites being arranged in a matrix of rows and columns;

b. a plurality of column lines, each connected respectively to the sensing sites of each column, said lines arranged in a plurality of consecutively numbered sets, each set including the same number of consecutively numbered lines;

c. a plurality of charge integrating means connected to one of said lines of each set, respectively, for simultaneous readout of charges through the lines of at least one said set;

d. switch means for connecting each said set, in turn, for readout;

e. a plurality of video channel circuits, respectively, in circuit with each said integrating means for respectively transmitting an output signal from each said integrating means; and

f. a correction circuit means in circuit with said plurality of video channel circuit means for generating a correction signal to cancel a D.C. offset voltage between the output signals on said video channel circuit means.

3,937,875

SYSTEMS FOR ELIMINATING HIGH-FREQUENCY DISTURBANCES IN TELEVISION CAMERAS

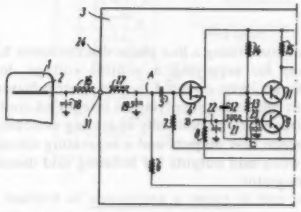
Mohamed Marey, Gross-Gerau, and Klaus Pollath, Nieder-Ramstadt, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Aug. 15, 1974, Ser. No. 497,705

Claims priority, application Germany, Sept. 1, 1973, 2344154

Int. Cl.[2] H04N *5/21*

U.S. Cl. 178—7.2 **4 Claims**



1. In a television camera system comprising a television camera tube with a signal electrode for providing a video signal, a first amplifier stage having an input terminal and connected for receiving and for amplifying the video signal to provide an amplified video signal at a first stage output terminal, and a second amplifier stage having a second stage input terminal for receiving the amplified video signal from the first stage output terminal and for further use in any conventional manner, and wherein there are parasitic capacitances to ground respectively from the signal electrode, the first stage input terminal, the first stage output terminal, and the second stage input terminal, the improved system for eliminating the effects of stray transmitted television signals from the amplified video signal comprising:

A. a first inductance inserted between the signal electrode and the first stage input terminal and forming, together with the parasitic capacitances to ground respectively from the signal electrode and from the first stage input terminal, a first low-pass filter having a cutoff frequency above the frequency of the video signal but below the frequency of the stray transmitted television signals,

B. a second inductance inserted between the first stage output terminal and the second stage input terminal and forming, together with the parasitic capacitance to ground respectively from the first stage output terminal

and the second stage input terminal, a second low-pass filter having a cutoff frequency above the frequency of the video signal but below the frequency of the stray transmitted television signals, and

C. A shield means for completely blocking off the amplifier stages from stray transmitted television signals.

3,937,876

PICTURE DISPLAY APPARATUS INCLUDING A LINE PHASE DISCRIMINATOR FOR GENERATING A CONTROL VOLTAGE

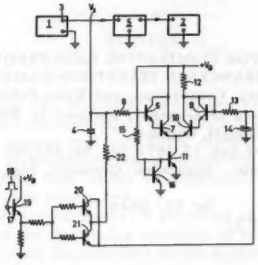
Willem Hendrik Amsen, and Paulus Joseph Maria Hovens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 11, 1971, Ser. No. 197,886

Claims priority, application Netherlands, Nov. 24, 1970, 7017137

Int. Cl.² H04N *5/04*

U.S. Cl. 178—7.3 R **3 Claims**



1. A circuit comprising a line phase discriminator having an output means for supplying a control voltage, integrator means having an input coupled to said discriminator output and an output means for supplying an integrated control voltage, a field frequency periodically operating switching means coupled between said outputs and a separating circuit means coupled between said outputs for isolating said discriminator from said integrator.

3,937,877

POSITION INDICATING DEVICE

Hien Vodinh, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 456,401, March 27, 1974, abandoned. This application Apr. 17, 1974, Ser. No. 461,665

Int. Cl.² H04N *3/16*

U.S. Cl. 178—7.3 R **5 Claims**

1. Television receiver channel numeral indicating apparatus comprising,

tuner means for receiving a television signal and having a tuner shaft rotatable to any of a plurality of positions, each position corresponding to a respective television transmitted channel,

disc means attached to said tuner shaft and rotatable therewith,

a plurality of slot means being placed in said disc means,

a plurality of cam sticks, each stick having a cam surface, said cam sticks insertable into and removable from a respective slot means,

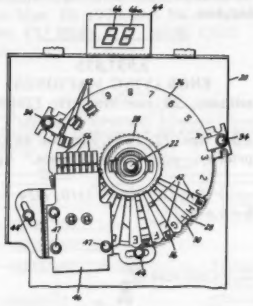
a leaf switch panel fixedly mounted to the television receiver chassis and carrying in a cantilever manner a plurality of leaf switches,

said panel being positioned so that the free end of said leaf switches are in registration with the cam surfaces of said cam stick, as said tuner shaft is rotated,

multi-segment display means having a plurality of individual segments being located on said television receiver at a readily viewable position,

means for illuminating each of said segments,

each of said leaf switches being in operable relation to said means for illuminating a segment of said display means,



said cam surfaces being configured to operate those switches which will illuminate the segments to numerically identify on said display means the tuner channel selected.

3,937,878

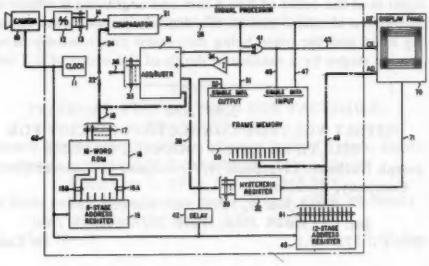
ANIMATED DITHERED DISPLAY SYSTEMS

Charles Norris Judice, Lincroft, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 21, 1975, Ser. No. 542,863

Int. Cl.² H04N *3/14*

U.S. Cl. 178—7.3 D **15 Claims**



1. In a display system including a plurality of selectively energized and de-energized bi-level display cells to which are assigned respective dither threshold values, a method for representing a matrix of picture elements each having a predetermined intensity and each corresponding to a respective one of said display cells, said method comprising the steps of

accessing a de-energized one of said cells only if the intensity of the corresponding picture element bears a first predetermined relationship to the dither threshold value assigned to that cell, and

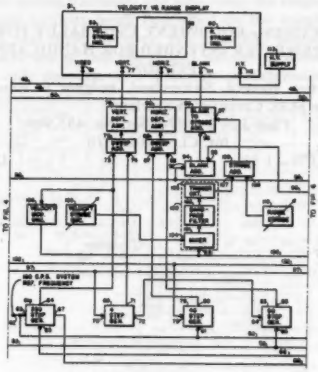
accessing an energized one of said cells only if the intensity of the corresponding picture element bears a second predetermined relationship to the dither threshold value assigned to that cell.

3,937,879

INFORMATION DISPLAY SYSTEM HAVING MAIN AND AUXILIARY SWEEPS

Garold K. Jensen, Pinecrest, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 29, 1965, Ser. No. 476,782
Int. Cl.[2] H04N *3/16, 5/44*
U.S. Cl. 178—7.5 R 15 Claims



1. A display system for multi-dimensional information comprising:

display means having an input, horizontal deflection circuit, and vertical deflection circuit;

means for applying information having at least first and second dimensions to said input, said first dimension of said information having a first frequency, said second dimension of said information having a second frequency;

means for applying a first sweep signal to one of said deflection circuits, said first sweep signal having a frequency equal to a multiple of said first frequency;

means for applying a second sweep signal to said one deflection circuit, said second sweep signal having a frequency different from the frequency of said first sweep signal; and

means for applying a third sweep signal to the other of said deflection circuits, said third sweep signal having a frequency equal to a multiple of said second frequency.

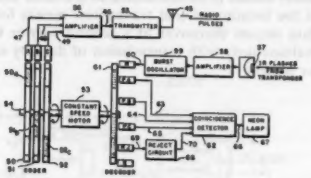
3,937,880

MAGNETIC DISC CODER-DECODER

Vesper A. Schlenker, Moorestown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 5, 1957, Ser. No. 700,919
Int. Cl.[2] G08C *19/16;* H04L *9/00*
U.S. Cl. 178—22 8 Claims

1. A magnetic disc coder-decoder comprising a rotatable magnetic disc means, said disc means being adapted to have a code comprising a plurality of tone bursts recorded thereon, means for rotating said disc means, means for taking said tone burst from said disc means and transmitting said code in the form of pulses of radiant energy, means for receiving transponder reply pulses in the form of coded infrared flashes, means for converting said infrared flashes to tone bursts, means for recording said tone bursts on said disc means, a coincidence detector, means for taking said tone bursts from said disc means for applying said tone bursts to said coincidence detector, said coincidence detector providing a single



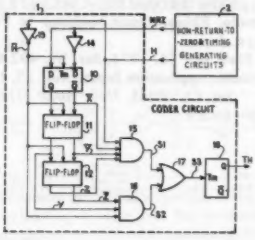
pulse output only when simultaneous application thereto of a predetermined number tone bursts.

3,937,881

METHOD OF AND SYSTEM FOR TRANSCODING BINARY SIGNALS WITH REDUCED CHANGEOVER RATE

Thaddeus Hawkes, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 18, 1974, Ser. No. 480,398
Claims priority, application France, June 22, 1973, 73.22878
Int. Cl.[2] H04L *15/00*
U.S. Cl. 178—68 10 Claims



1. A method of converting a series of bits into a binary signal with a reduced changeover rate, comprising the steps of:

temporarily storing successive bits of a bit stream coinciding with respective clock cycles;

generating a two-level signal voltage;

changing the level of said signal voltage in the middle of a clock cycle upon a shift from a first kind of bit to a second kind of bit in said bit stream;

changing the level of said signal voltage at the end of a clock cycle upon the occurrence of said first kind of bit in a succession of a plurality of bits of said first kind following a shift from a bit of said second kind in said bit stream; and

keeping constant the level of said signal voltage in all other instances.

3,937,882

FULL-DUPLEX COMMUNICATION SYSTEM ON A TWO WIRE LINE

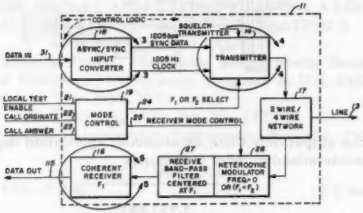
John A. C. Bingham, Palo Alto, Calif., assignor to Vadic Corporation, Mountain View, Calif.

Filed Apr. 11, 1974, Ser. No. 460,179
Int. Cl.[2] H04L *5/14;* H04M *11/00*
U.S. Cl. 178—69.5 R 12 Claims

1. In a full-duplex modem for communicating over a two wire circuit;

transmitter means to be connected to the two wire circuit for transmitting a data stream thereover at a first carrier frequency;

receiver means to be connected to the same two wire circuit at the location of said transmitter means for receiving a data stream thereover at a second carrier frequency simultaneously with transmission of data by said transmitter means;



said transmitter means including means for synchronously encoding and modulating the data of the data stream to be transmitted at the first carrier frequency; and

said receiver means including means for coherently detecting the data in the data stream received at the second carrier frequency.

3,937,883

BRAKING CIRCUIT FOR USE WITH PHASE SYNCHRONIZING CIRCUITRY

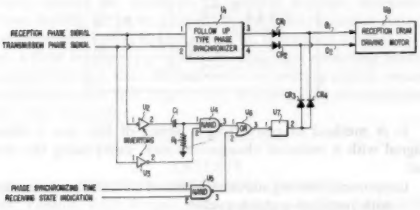
Kenji Tanimoto, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed July 26, 1974, Ser. No. 492,907

Claims priority, application Japan, Aug. 17, 1973, 48-91693

Int. Cl.[2] H04L 7/00; H02P 5/16

U.S. Cl. 178—69.5 F **4 Claims**



1. A circuit which synchronizes a motor at the receiving end of a communication link with one at the transmitting end thereof, said receiving end including means responsive to a receiving end motor for generating a reception phase signal and said transmitting end including means responsive to a transmitting end motor for generating a transmission phase signal, said circuit comprising

a phase synchronizing circuit for repeatedly applying to the main coils of the receiving end motor reduced frequency signals having a lower frequency than the rated frequency thereof to thereby reduce the phase deviation between the receiving and transmitting end motors, and

a braking circuit for enhancing the speed and accuracy of said phase synchronizing circuit, said braking circuit including means responsive to said reception phase signal for applying for a predetermined period of time a direct-current voltage to said main coils of the receiving end motor in lieu of said reduced frequency signals,

said phase synchronizing circuit generating said reduced frequency signal in response to said reception phase signal and said braking circuit including means for preventing said reduced frequency signal from being applied to said main coils while said direct-current voltage is being applied thereto,

said phase synchronizing circuit ceasing the generation of said reduced frequency signal in response to said transmission phase signal, said braking circuit including means for permitting the application of said reduced frequency signal to said main coils subsequent to the termination of said direct-current voltage but prior to the occurrence of said transmission phase signal whenever said transmission phase signal occurs subsequent to the termination of said direct-current voltage.

3,937,884

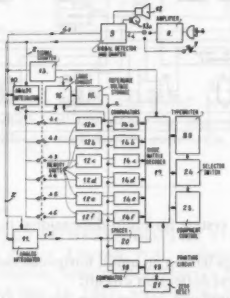
DECODING EQUIPMENT ESPECIALLY FOR A TYPEWRITER INTENDED FOR HANDICAPPED PERSONS

Jean Richez, Geneva, Switzerland, assignor to Rotary Club Geneve SUD, Carouge, Switzerland

Filed July 2, 1974, Ser. No. 485,980

Int. Cl.[2] G10L 1/16

U.S. Cl. 179—1 SE **12 Claims**



1. A decoding control device for controlling an electrical circuit in response to a coded control signal, comprising

a receiver able to receive a control signal having successive short or long elements and comprising at least one short and one long element,

identifying means for identifying each element of a control signal so received as short or long by comparison of a signal derived from the element with a reference signal having a value dependent on a signal derived from at least one other element of the control signal, means for producing the reference signal, and means for producing for each element an identifying signal having a value corresponding to the identification of the element as short or long,

and a decoder responsive to a permutation of the identifying signals thereby to control an electrical circuit.

3,937,885

CONTROL CIRCUIT FOR A MATRIXED FOUR CHANNEL AUDIO REPRODUCING SYSTEM

Michael J. Gay, Geneva, Switzerland, assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 6, 1974, Ser. No. 503,833

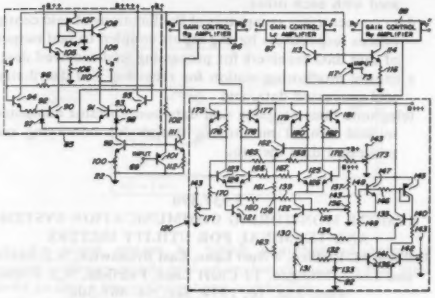
Int. Cl. H04r 5/00

U.S. Cl. 179—1 GQ **14 Claims**

1. In an audio reproducing system having a plurality of speakers driven by signals from four channels, which signals are derived from a two channel input, a control circuit comprising:

a. logic circuitry for separating the four channels into two pairs of channels and determining which signals in the two pairs of channels are dominant and providing output signals indicative thereof;

b. adjustable enhancement circuitry connected to receive the output signals from said logic circuitry and providing a pair of output signals for substantially increasing the output of the speakers driven by the dominant channels and reducing the output of the remaining speakers, said enhancement circuitry including first and second amplifier sections connected together so that the output voltage of one section increases as the output voltages of the other section decreases and vice versa, the output voltage of said sections being controlled by the output signals from said logic circuitry, said amplifier sections being constructed so that the output voltage of either section can only decrease to a minimum predetermined value,



and said amplifier sections further being constructed so that the decrease of output voltage in either section occurs substantially more rapidly than the increase of output voltage in the other section;

c. four gain control amplifiers each connected to a different channel and connected to drive a speaker associated with that channel, said gain control amplifiers further being connected in pairs and each pair being connected to receive one of the output signals from said adjustable enhancement circuitry for substantially increasing the drive provided by one pair of amplifiers while reducing the drive provided by the remaining pair of amplifiers in accordance with the output signals of said enhancement circuitry; and

d. balance and volume control circuitry connected to said gain control amplifiers for controlling the drive to each of said amplifiers relative to each of the other amplifiers.

3,937,886

POWER SUPPLY SWITCHING CIRCUIT FOR COMBINED AUDIO SYSTEM

Takahiko Saito, Kamakura; Koichi Iwase, Chofu, and Shojiro Shimada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 13, 1974, Ser. No. 505,623

Claims priority, application Japan, Sept. 19, 1973, 48-109689[U]

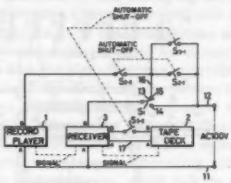
Int. Cl.² H04B *1/00*

U.S. Cl. 179—1 SW **10 Claims**

1. In a combined audio system including main audio apparatus having an amplifier and auxiliary audio apparatus connected to said main audio apparatus and having automatic shut-off means, a power supply circuit comprising:

main switch means connected between said main audio apparatus and a source of power and being operable to a first position for connecting said source to said main audio apparatus for energizing said main audio apparatus, and to a second position;

auxiliary switch means comprised of at least first and second series-connected interlocked switch means connected between said auxiliary audio apparatus and said source of power to selectively supply power from said source to said auxiliary audio apparatus, said first and second switch means being opened by said automatic shut-off means for de-energizing said auxiliary audio apparatus; and



means for connecting said main switch means in series with one of said first and second switch means such that power is selectively supplied to said main audio apparatus through said main switch means and said one switch means when said main switch means is operable to said second position.

3,937,887

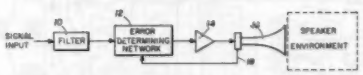
ACOUSTIC POWER SYSTEM

Francis A. Miller, Lawton, Okla., assignor to Ben O. Key, Lawton, Okla.

Filed May 15, 1969, Ser. No. 824,791

Int. Cl.² H04M *1/00*

U.S. Cl. 179—1 F **5 Claims**



1. The amplifier and loudspeaker system comprising:

a loudspeaker having a voice coil for producing acoustic energy in response to a current applied thereto;

an amplifier having an input and an output and an output impedance of the same order-of-magnitude as that of the speaker;

a first capacitor coupling the output of the amplifier to the loudspeaker;

an input network comprising a transistor with collector, base and emitter bias resistors, the base of the transistor being the input and the collector being the output;

a second capacitor coupling the output of the input network to the input of the amplifier; and

feedback means substantially capacitively coupling the terminal of the speaker to which the output of the amplifier is coupled to the emitter of the transistor of the input network.

3,937,888

SIGNAL TRANSMISSION WITH SECRECY

Oscar Myers, Mount Vernon, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

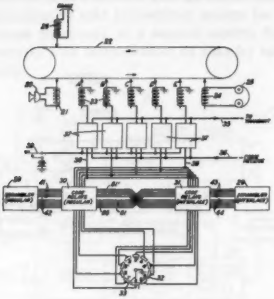
Filed July 17, 1943, Ser. No. 495,127

Int. Cl.² H04K *1/06*

U.S. Cl. 179—1.5 C **12 Claims**

1. In a privacy system in which the signals are divided into fragments on a time basis and the different fragments are delayed in transmission by different amounts to afford privacy, a timing means having a timing cycle divided into several periods, a relay individual to each period and individually operated during its respective period by said timing means, a

plurality of delay devices to introduce delay into said signals, means controlled by said timing means to select a delay device



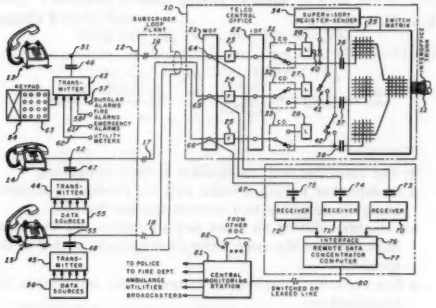
for each timing period, and means jointly controlled by said relays and selecting means to operate the selected devices.

3,937,889

DATA COMMUNICATION APPARATUS FOR USE IN A TELEPHONE SYSTEM

William W. Bell, III, Sands Point, and Peter K. Shizume, Hicksville, both of N.Y., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 15, 1973, Ser. No. 323,563
Int. Cl.[2] H04M *11/00*
U.S. Cl. 179—2 DP 6 Claims



1. A data communication system for use with the public telephone voice communication system including a plurality of telephone company central offices each with switching matrix means, inter-office trunk line means inter-coupling said switching matrix means of said central offices, a plurality of subscriber telephones associated with each central office, a subscriber loop plant having a plurality of subscriber loops connecting said telephones with said associated central office respectively, the data communication system comprising:

data sources at the locations of said telephones respectively for providing date to be transmitted,

data transmitters at the locations of said telephones respectively having inputs coupled to said data sources for receiving said data to be transmitted and having respective outputs for providing data signals representative of said data at frequencies above the standard telephone voice transmission frequency band of said telephone system,

first bridge taps connected to said subscriber loops at the locations of said telephones respectively,

first capacitors coupling said outputs of said transmitters to said first bridge taps respectively, thereby coupling said data signals to said subscriber loops respectively,

second bridge taps connected to said subscriber loops respectively at said central offices,

second capacitors coupled to said second bridge taps respectively,

data receivers at the locations of said central offices having inputs coupled through said second capacitors to said second bridge taps respectively for receiving said data signals and having outputs for providing received data corresponding to said received data signals.

low pass filters coupled between said second bridge taps respectively and said switching matrix means at said central offices for passing frequencies within said standard telephone voice transmission frequency band and for blocking frequencies of said data signals thereby preventing erroneous transmission of data through said switching matrix means between transmitters and receivers associated with the same central office but not associated with each other,

data concentrator computers at the locations of said central offices respectively having inputs coupled to said outputs of said data receivers for processing said received data,

a central monitoring station for receiving and distributing said processed data, and

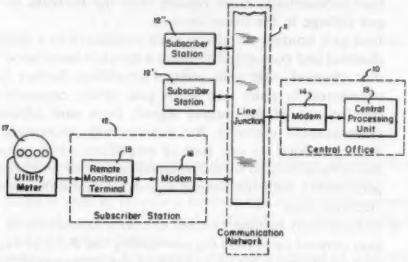
telephone lines coupling said data concentrator computers to said central monitoring station for conveying said processed data thereto.

3,937,890

REMOTE MONITORING COMMUNICATION SYSTEM AND TERMINAL FOR UTILITY METERS

William M. Blethen, 4 Noel Lane, East Brunswick, N.J. 08816, and Lee J. Milligan, 14 Cheri Lane, Fairfield, N.J. 07006

Filed Apr. 16, 1974, Ser. No. 461,308
Int. Cl.[2] H04M *11/02*
U.S. Cl. 179—2 A 7 Claims



5. A remote monitoring system operable over a communication network for selectively monitoring the contents of utility meters at remote locations and transmitting such contents upon command to a central office, said system including:

a. a central office including a data processing unit, means for generating an address signal corresponding to an address of a selected subscriber station for addressing any of a plurality of remote monitoring terminals to obtain data stored therein, and a modem for connecting the data processing unit with such communication network; and

b. a plurality of subscriber stations, each including a modem connected to such communication network for communicating therethrough with the central office, means for receiving an address signal, an address memory for storing an address corresponding to said subscriber station, and a comparator for comparing addresses corresponding to received address signals with the address stored in the address memory, each subscriber station thereby being selectively addressable by said data processing unit, and each subscriber station including a remote monitoring terminal connected to a utility meter at the subscriber station for serially transmitting to such data processing

unit a count corresponding to that contained in the utility meter, said remote monitoring terminal including a pulse output converter for providing output pulses from such utility meter corresponding to increments in the count stored therein, said converter comprising a cam mountable on the shaft of the utility meter corresponding to the least significant digit of said count, and a switch operable by said cam to provide output pulses corresponding to increments in such least significant digit.

3,937,891

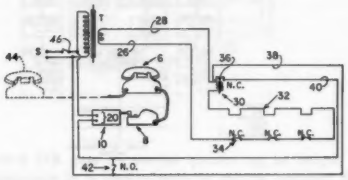
BURGLAR ALARM

George K. Roeder, P.O. Box 4335, Odessa, Tex. 79760

Filed Sept. 16, 1974, Ser. No. 506,439

Int. Cl.² H04M *11/04*

U.S. Cl. 179—5 R **3 Claims**



1. An alarm system by which unauthorized entrance through a closure means into an enclosure causes a first telephone to dial a second telephone comprising:

a first switch means (**34**) for connection to a closure means so that movement of the closure means activates said first switch means;

a motor-driven switch actuator (**10**), a first telephone (**6**), a second telephone (**44**), means forming an automatic dialing apparatus by which a predetermined telephone number can be dialed;

circuit means connecting said automatic dialing apparatus to said first telephone; means, including a call switch on said automatic dialing apparatus, by which said first telephone will dial said second telephone when said call switch is activated;

circuit means connected to said first switch means for causing said motor of said motor-driven switch actuator to be energized upon movement of the closure means to which said first switch is connected;

means by which said motor-driven switch actuator is positioned respective to said automatic dialing apparatus so that said call switch is actuated when said motor-driven switch actuator is energized;

said motor-driven switch actuator being a motor-driven reduction gear assembly having an output shaft, a cam affixed to said shaft, said cam being arranged respective to said motor-driven reduction gear assembly, shaft and call switch, so that rotation of said shaft causes said cam to engage and actuate said call switch.

3,937,892

ELECTRONIC TIME-DIVISION-MULTIPLEXED PABX TELEPHONE SYSTEM

Alan Bloch, New York, N.Y.; Charles B. Falconer, Hamden; David L. Joslow, and Harold M. Straube, both of Chester, all of Conn., assignors to Chestel, Inc., Chester, Conn.

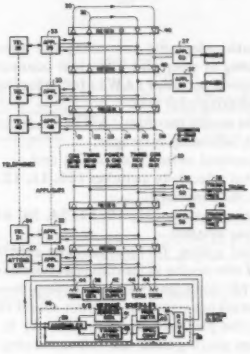
Continuation-in-part of Ser. No. 296,322, Oct. 10, 1972, abandoned. This application Jan. 21, 1974, Ser. No. 435,318

Int. Cl.² H04J *3/12*

U.S. Cl. 179—15 AL **27 Claims**

7. A communication system for audio information comprising: a timing line, a communication line separate from said timing line, a timing signal generator for generating timing signals applied to said timing line and which timing signals divide time into repetitive frames of time slots, said time slots of each frame including at least one thereof assigned exlusively to signalling and supervision use and a plurality of other ones thereof assigned exclusively to audio communication use, and a plurality of appliques each connected to both said timing line and said communication line, said appliques each including a means controlled by said timing signals for inserting signalling and supervision information onto said communication line in said signalling and supervision time slots and a means controlled by said timing signals for extracting from said communication line the signalling and supervision information appearing in said signalling and supervision time slots, said appliques further including means responsive to the signalling and supervision information interexchanged by said appliques over said communication line in said signalling and supervision time slots for making and breaking talking path connections between said appliques, which talking path connections are made over said communication line in said audio communication time slots.

21. A communication system comprising: a lineal transmission medium including a communication line, means time dividing the usage of said communication line into a number of time-division-multiplexed communication channels over which information may be transmitted on said communication line said means time dividing the usage of said communication



line including means for transmitting on said transmission medium and along with the information on said communication line a timing signals consisting of repetitive frames of pulses, which pulses divide each frame into a number of time slots, said communication channels including a plurality of audio communication channels, a plurality of appliques located along said transmission medium, means providing each of said appliques sending access to one of said audio communication channels, means providing each of said appliques with receiving access to all of said audio communication channels, each of said appliques having a send terminal connected to said communication line at one point along said transmission medium for said sending access and a receive terminal connected to said communication line at a second point along said transmission medium for said receiving access, a first counter in each applique for counting pulses taken from said transmission medium at the associated said one point to identify said time slots, means in each applique responsive to the count of its said first counter for controlling its sending access to its associated one of said audio communication channels, a second counter in each applique for counting pulses taken from said transmission medium at the associated said second point to identify said time slots, and means in each applique responsive to the count of its said second counter for controlling the receiving access of said applique to said audio

communication channels.

3,937,893

AUTOMATIC TELEPHONE ANSWERING DEVICE

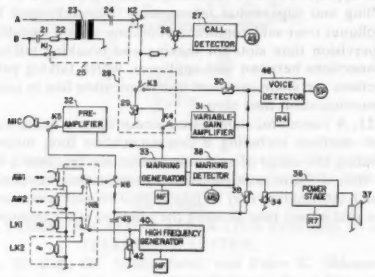
Willy Muller, Zollikon, and Markus Moser, Egg, both of Switzerland, assignors to Willy Muller, Zollikon, Switzerland

Filed July 24, 1973, Ser. No. 382,067

Claims priority, application Switzerland, July 31, 1972, 11353/72

Int. Cl.² H04M *1/64*; G11B *23/04*

U.S. Cl. 179—6 R **17 Claims**



1. Automatic telephone answering and announcement device comprising in operative electrical connection:

a. a first sound recorder (AW1) for recording, reproducing and answering oral text;

b. a second sound recorder (AW2) for recording and playing back incoming messages;

c. action control switch means (3); and

d. additional selectivity switches (10, 11, 12, 13) for selecting specific functions;

e. a switching system (33, 40, 52, 54, 56, 65, 66);

f. amplifying system;

g. a control system for independent control of the work cycle of the device in its different functions, said control system (3) including third recording means to apply at least a marking signal on the first sound recorder (AW1) and for the playback thereof, whereby to switch the device from playing back the call answering text to recording the incoming message and to correct in event of a premature ending of the playback of the call answering text;

h. call detector means (27);

i. voice detector means (46) for incoming messages;

j. marking detector means (38) for detecting marking signals on the first recorder;

said action control means (3) and the additional switches (10, 11, 12, 13) as well as the call detector (27), the voice detector (46) and the marking detector (38) being interconnected to deliver binary message signals (ST1W), STWT, STAT, ASTE, ST, STO, RT, LT, AS, SP, MS);

k. a digital control means (67, 68, 69) comprising an integrated circuit, the inputs (67) of which are in connection with said action control switch (3), the additional switches (10, 11, 13) and the outputs of said respective detectors (27, 46 and 38) and the output of the digital control means (68) being connected with control inputs of an electrical switching means (33, 40, 52, 54, 56, 65, 66), whereby the digital control means, depending on its internal condition and that of the binary message signal, generates binary control signals (MTX, MTP, MAX, MAP, HF, NF, ZL1, ZL2, R1 to R8) for said electrical switching means requiring control;

l. driving means for the respective recorders; and

m. a source of electrical power.

3,937,894

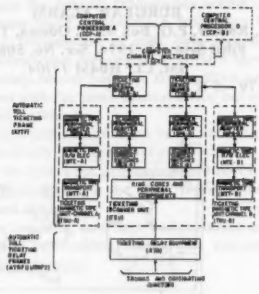
ADDRESSABLE TICKETING SCANNER

George T. Grzybowski, Westchester; David E. Gaon, Villa Park, both of Ill.; Bryan F. Gearing, Bedford, Mass., and Martin R. Winandy, La Grange, Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Jan. 18, 1974, Ser. No. 434,743

Int. Cl.² H04M *15/18*

U.S. Cl. 179—7.1 R **14 Claims**



1. In a communication switching system including a switching network and common control equipment for establishing paths through the switching network between calling and called lines, said network including status means for indicating a busy condition for a given path through the network, scanning means responsive to calls-for-service from calling lines, and memory means for storing addresses of the lines requesting service, a ticketing arrangement comprising:

monitoring means including a plurality of monitoring devices responsive to said status means for determining that a given path is busy;

switching means for selectively connecting said monitoring devices to busy paths established between calling and called lines; and

means responsive to the addresses stored in said memory means for controlling said switching means.

3,937,895

CIRCUIT ARRANGEMENT FOR DETECTING DOUBLE CONNECTIONS IN DIGITAL TELECOMMUNICATION SWITCHING SYSTEMS

Otto Karl, Forstenrieder-Allee 78/III, 8000 Munich 71, Germany

Filed Feb. 22, 1974, Ser. No. 444,837

Claims priority, application Germany, Feb. 22, 1973, 2308855

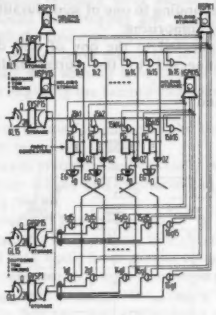
Int. Cl.² H04J *3/00*

U.S. Cl. 179—15 AT **1 Claim**

1. In a telecommunication switching system for time division multiplex (TDM) signals wherein incoming TDM trunks, coupled through first time coupling stages in the form of storages allocated to individual TDM trunks, are connectable in pairs, by means of crosspoint switches, over pairs of TDM links to outgoing TDM trunks which are coupled through second time coupling stages having storages allocated to individual TDM trunks, apparatus for detecting double connections comprising:

OR gate means having a plurality of inputs and an output inserted in a said TDM link, said inputs being connected to outputs of said crosspoint switches connecting the incoming TDM trunks with said TDM link and said output being connected to crosspoint switches connecting said TDM link to said outgoing TDM trunks.

parity generator means having a plurality of inputs connected to said plurality of inputs of said OR gate means, and



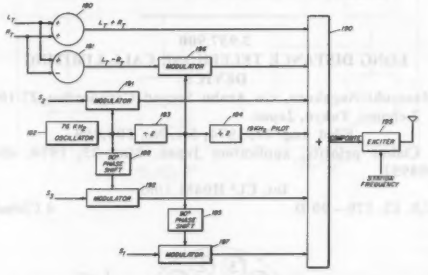
exclusive OR gate means for producing an output signal responsive to a dissimilarity in signals coupled thereto and thereby indicating a double connection, said exclusive OR gate having one input connected to an output of said parity generator means and another input connected to the output of said OR gate means.

3,937,896

COMPATIBLE FOUR CHANNEL RADIO BROADCAST AND RECEIVING SYSTEM

Benjamin B. Bauer, Stamford, Conn., assignor to CBS Inc., New York, N.Y.

Filed Apr. 18, 1974, Ser. No. 462,044
Int. Cl.[2] H04R *5/00*
U.S. Cl. 179—15 BT **13 Claims**



1. A compatible four channel system for use in conjunction with a radio transmission system for transmitting four individual audio signals designated L_f, L_b, R_b and R_f over a medium having primary and secondary information channels and first and second subsidiary information channels, said primary and secondary channels carrying information that is consistent and compatible with existing monophonic and stereophonic standards; comprising

a. means for forming a first composite signal designated L_T which contains, to the extent they are present, L_f in a dominant proportion and L_b and R_b in sub-dominant proportions, L_b and R_b being phase shifted with respect to each other;

b. means for forming a second composite signal designated R_T which contains, to the extent they are present, R_f in a dominant proportion and L_b and R_b in sub-dominant proportions, L_b and R_b being phase shifted with respect to each other;

c. means for forming first and second conjugates of said first and second composite signals, respectively, said first and second conjugates being designated L_T^* and R_T^*;

d. means for forming a sum signal as a function of the sum of L_T and R_T and for applying said sum signal to the primary information channel;

e. means for forming a difference signal as a function of the difference between L_T and R_T and for applying said difference signal to said secondary information channel; and

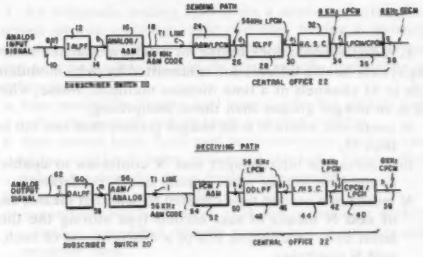
f. means for applying said first and second conjugates to said first and second subsidiary channels, respectively.

3,937,897

SIGNAL CODING FOR TELEPHONE COMMUNICATION SYSTEM

Ching-Long Song, Columbus, Ohio, assignor to North Electric Company, Galion, Ohio

Filed July 25, 1974, Ser. No. 491,767
Int. Cl.[2] H03K *11/00, 13/22*
U.S. Cl. 179—15 AP **29 Claims**

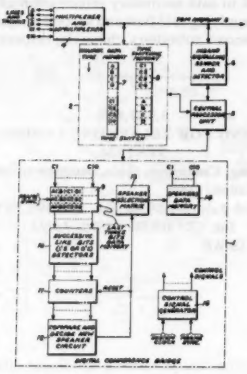


1. In a telephone communication system having a plurality of transmission lines over which voice signals are transmitted in an adaptive delta modulation code, the improvement comprising sending means including first digital converter means for converting said adaptive delta modulation signals received over one of said transmission lines to linear pulse code modulation signals, first filter means connected to the output of said first digital converter means for smoothing the signals output from said digital converter means, first speed converter means connected to the output of said first filter means for decreasing the speed of the signals output from said filter means to a value compatible for use with a pulse code modulation communication system; and receiving means including second speed converter means, input means for providing said pulse code modulation signals from said communication system to said second speed converter means, second filter means connected to the output of said second speed converter means for smoothing the signals output therefrom, and second digital converter means for converting the pulse code modulation signals output from said second filter means to adaptive delta modulation signals for transmission over a second one of said transmission lines.

3,937,898
DIGITAL CONFERENCE BRIDGE

Anthony Frank Presto, Nutley; James Grant Dunn, Upper Montclair, and Thomas Chungmin Chen, West Caldwell, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 18, 1974, Ser. No. 489,574
Int. Cl.[2] H04M *3/56*; H04Q *11/04*
U.S. Cl. 179—18 BC **9 Claims**



1. A digital conference bridge for a delta modulated switching system having information transmitted by delta modulated bits in M channels of a time division multiplex frame, where M is an integer greater than three, comprising:

N conferees, where N is an integer greater than two but less than M;

first means to interconnect said N conferees to enable a conference to take place among said N conferees;

N means of a second type coupled to said first means, each of said N means of said second type storing the three latest delta modulation bits of a different one of each of said N conferees;

N means of a third type each coupled to a different one of said N means of said second type, each of said N means of said third type providing an indication when said three latest bits have identical values;

fourth means coupled to each of said N means of said third type to determine from said indications a new speaker and to produce a control signal identifying said new speaker; and

fifth means coupled to said first means, said N means of said second type and said fourth means responsive to said control signal to distribute said delta modulation bits of said new speaker to all of said N conferees.

3,937,899
TONE DETECTOR USING SPECTRUM PARAMETER ESTIMATION

Jeffrey Neil Denenberg, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 30, 1975, Ser. No. 545,410
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **9 Claims**

1. A tone detector comprising:

an input terminal for receiving an input signal;

a plurality of estimating means each comprising:

an input connected to said input terminal; an output; and

means for generating at said estimating means output an estimate of a parameter of the frequency spectrum of said input signal;

one or more decision circuits, each decision circuit comprising:

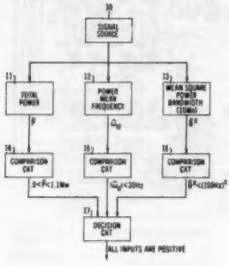
a plurality of inputs each connected to a respective one of said plurality of estimating means outputs;

an output; and

a plurality of comparison circuits, each comparison circuit corresponding to one of said plurality of estimating means and comprising:

an input connected to the one of said decision circuit inputs connected to the corresponding estimating means;

an output; and



means for generating at said comparison circuit output a first signal if the signal present on said input of said comparison means is essentially equal to the value of the corresponding parameter of a tone to be detected and a second signal in the absence of equality; and

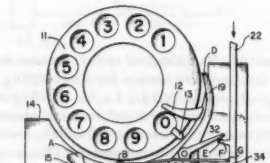
means for generating at said decision circuit output a third signal if all of said outputs of said plurality of comparison circuits have a first signal present and a fourth signal if one or more of said outputs of said plurality of comparison circuits has a second signal present; and

one or more output terminals, each connected to a corresponding decision circuit output for indicating the presence or absence of a predetermined tone whose presence is to be detected.

3,937,900
LONG DISTANCE TELEPHONE CALL LIMITING DEVICE

Masayuki Nagakura, c/o Azabu Second Corporation 27-10, 3-chome, Tokyo, Japan

Filed Aug. 27, 1974, Ser. No. 500,859
Claims priority, application Japan, May 25, 1974, 49-058951
Int. Cl.[2] H04M *1/66*
U.S. Cl. 179—90 D **4 Claims**



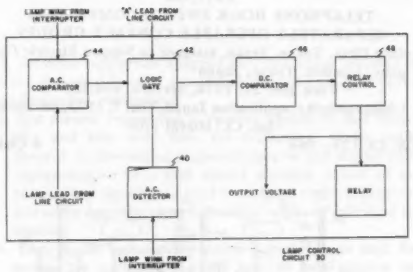
1. A long distance telephone call limiting device for preventing the dialing of a long distance telephone number said device comprising:

a. a telephone set;
b. a stopper provided on the outer periphery of the finger hole of the dial numeral 0 of a telephone dial plate;
c. first, second and third rotatable cam members spaced from said dial plate;
d. an arch-shaped 0-check lever means, wherein one end thereof checks said stopper and the other end thereof engages with the first cam member of said cam members;
e. a rotatable sensing lever means for sensing the rotation of the dial plate said sensing lever means including a hook portion for engaging the second cam member of said cam members;
f. a hook lever means for engaging the third cam member of said cam members;
g. set lever means pivotably and coaxially mounted with said 0-check lever means and connected to said hook lever means; and
h. a connecting rod having a plurality of hook means for engaging said set lever means, said rotation sensing lever means and said hook lever means respectively said rod moving in response to the movement of a handset on and off the telephone, wherein the dialing of an 0 or 1 in either of the first two digits of a phone number prevents the dialing of the remainder of the number.

3,937,901
LAMP CONTROL CIRCUIT FOR KEY TELEPHONE SYSTEMS

Coy Edwin Matheny, Corinth, Miss., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed June 3, 1974, Ser. No. 475,420
Int. Cl.² H04M *1/21*
U.S. Cl. 179—99 **5 Claims**

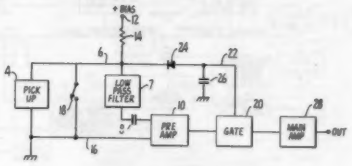


1. In a key telephone system, a circuit for detecting the condition of a line in the system, in which the line may be in one state in which a line lamp representing that line is being pulsed by a signal comprised of current interrupted at a first rate, or in a second state in which the lamp is being pulsed by a signal comprised of current interrupted at a second rate, said circuit including means receptive of a current signal directed toward the line lamp, means for receiving a reference signal at a predetermined amplitude and at an interrupted predetermined one of said rates, means for comparing the rate of the signal directed toward said lamp against the predetermined signal rate, and means responsive to the rate of the signal directed toward said lamp and said predetermined reference signal being essentially identical for producing an output reaction indicative of the signal directed toward the lamp.

3,937,902
CARTRIDGE MUTING CIRCUIT

Louis Dorren, Millbrae, Calif., assignor to Quadracast Systems, Inc., San Mateo, Calif.

Filed Apr. 18, 1974, Ser. No. 461,884
Int. Cl.² G11B *15/12*
U.S. Cl. 179—100.4 A **3 Claims**



1. An automatic muting system for a semi-conductor phonograph pickup cartridge, said cartridge having a shorting switch for the output leads of the cartridge, said muting circuit being actuated solely by said shorting switch, comprising in combination:
a. bias means for biasing said semi-conductor pickup cartridge through its output leads at a first polarity,
b. first output leads from said semi-conductor pickup cartridge, said leads being connected through a passive time delay circuit to the input leads of an amplifier,
c. bias means for said amplifier,
d. second output leads from said semi-conductor pickup cartridge connected directly to said bias means for said amplifier, and
e. means whereby the bias means for said amplifier is cut off when a voltage of opposite polarity is applied to said second output leads.

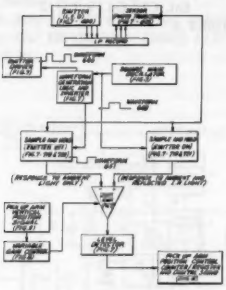
3,937,903
SOUND TRACK SELECTOR SYSTEM FOR PHONOGRAPH RECORD PLAYERS

Robert Osann, Jr., 6725 Mariposa Ave., Citrus Heights, Calif. 95610

Filed Apr. 29, 1974, Ser. No. 464,927
Int. Cl.² G11B *19/14*
U.S. Cl. 179—100.4 D **12 Claims**

12. In a sound track selection system for a phonograph record, means for sensing the peripheral positions of the pickup arm comprising a rotatable shaft for the pickup arm, a disc mounted on said shaft below the turntable platform and rotatable with said shaft, said disc being provided with two slots radially spaced at different distances from the axis of rotation of the disc and one slot radially spaced from the axis of rotation of the disc at substantially the same distances represented by each of the aforesaid two slots, each said slot also being arcuately spaced from one another to represent positions of "rest," "return" and "play" with respect to the pickup arm, and an optical encoder assembly comprising a pair of light emitting diodes and a pair of photo-transistors in fixed position to register with the aforesaid slots and develop

a corresponding signal when each said slot is rotated to permit light from a diode to be transmitted to the corresponding



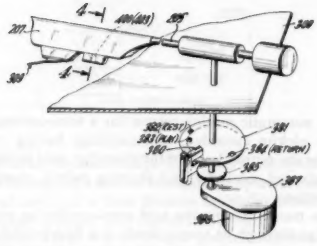


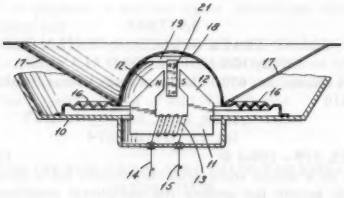
photo-transistor sensor, thereby producing a signal representing the position of the pickup arm.

3,937,904

MOVING MAGNET ELECTROACOUSTIC TRANSDUCER

Rollin James Parker, Greenville, Mich., assignor to Hitachi Magnetics Corporation, Edmore, Mich.

Filed Aug. 7, 1974, Ser. No. 495,305
Int. Cl.[2] H04R 9/02
U.S. Cl. 179—114 R 6 Claims



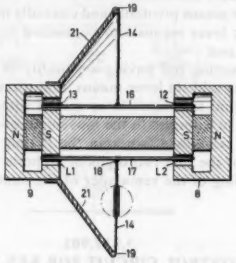
1. An electroacoustic transducer device comprising a (U-shaped) core of magnetically permeable material having solely a simple U-shape, a stationary electrical coil around said core for the creation of an electromagnetic field, a pole piece mounted on each protruding end of said core, the pole pieces defining a gap between the protruding ends of said core, a permanent magnet centrally positioned within said gap and having diagonally positioned poles of the same magnetic orientation whereby the side facing each pole piece has an end which is repelled from said pole piece and an opposite end which is attracted to said pole piece when said electrical coil is energized; and a diaphragm driven by reciprocating movement of said magnet.

3,937,905

MOVING VOICE COIL TRANSDUCER HAVING A FLAT DIAPHRAGM OF AN IMPREGNATED KNIT

Josef W. Manger, Karlstadter Strasse 5, 8725 Arnstein, Germany

Filed July 24, 1973, Ser. No. 382,157
Claims priority, application Germany, July 25, 1972, 2236374
Int. Cl.[2] H04R 7/04, 9/02
U.S. Cl. 179—115.5 R 13 Claims



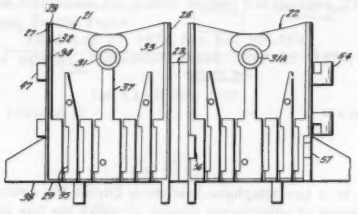
1. An electro-acoustic transducer system comprising:
a magnetic system having pole shoes and an air gap limited by said pole shoes;
a substantially flat viscoelastic diaphragm which is highly elastically stretchable;
fixed support means fixed to said magnetic system and supporting said diaphragm; and
moving coil means fixed to a portion of said diaphragm.

3,937,906

TELEPHONE HOOK SWITCH COMPRISING SEPARATELY OPERABLE CONTACT GROUPS

Keizou Ohta, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Jan. 31, 1974, Ser. No. 438,337
Claims priority, application Japan, Feb. 7, 1973, 48-16038
Int. Cl.[2] H04M 1/08
U.S. Cl. 179—164 6 Claims



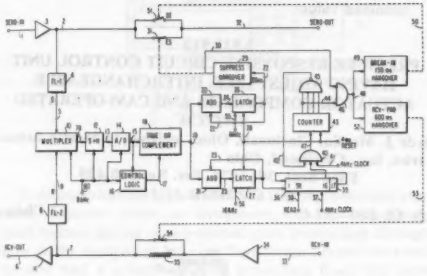
1. In a telephone hook switch including a plurality of contact members, a frame member having a pair of axially aligned pivot members outwardly extended from said frame member and having means for supporting said contact members enclosed within said frame member and positioned on both sides of said pivot members common axis, and a lever member pivotally mounted on said pivot members for positively moving predetermined ones of said contact members into and out of contact with predetermined other ones of said contact members, the improvement wherein said frame member comprises two initially non-contacting block portions, each having a back surface, one of said pivot members disposed on each said back surface, a first side surface disposed

perpendicular to said back surface on one side of said pivot member axis, and a second side surface spaced a predetermined amount from said first side surface and disposed on the other side of said pivot member axis, the back surfaces of both said block portions being brought into substantial contact with each other with the first and second side surfaces of one of said block portions being coextensive with the respective first and second side surfaces of the other of said block portions.

3,937,907
DIGITAL ECHO SUPPRESSOR

Samuel Joseph Campanella, Gaithersburg; Henri George Suyderhoud, Potomac, and Michael Onufry, Jr., Gaithersburg, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.

Filed June 13, 1974, Ser. No. 479,061
Int. Cl.[2] H04B *3/20*
U.S. Cl. 179—170.6 **9 Claims**



1. An echo suppressor adapted for connection between the receive and send lines of a communications circuit to reduce send line echo, comprising:

a. first means, connected to receive signals on said receive line and said send line, for producing, at an output thereof, in alternating sequence receive line digital codes representative of a first signed absolute values of said receive line signals and send line digital codes representative of an opposite signed absolute values of said send line signals,

b. first digital summation means connected to said first means for accumulating the sum of said receive line digital codes over repetitive fixed first periods of time,

c. suppression hangover means connected to said first digital summation means for providing an interrupt output for a first predetermined hangover time when said sum accumulated by said first digital summation means equals or exceeds a predetermined threshold value,

d. second digital summation means connected to said first means for accumulating the sum of said receive line and send line digital codes over said repetitive fixed first periods of time,

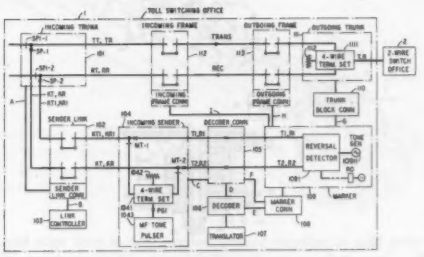
e. storage means connected to said second digital summation means for storing indicia representing the signs of the last N sums accumulated by said second digital summation means, and

f. break-in logic means connected to said storage means and to said suppression hangover means for providing a break-in output for a second predetermined hangover time when M of the indicia stored in said storage means represent said opposite sign and said suppression hangover means is providing said interrupt output, where M is a predetermined positive number less than N.

3,937,908
NETWORK PATH TEST CIRCUIT

Charles John Funk, Columbus, and George Minchenko, Reynoldsburg, both of Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 27, 1975, Ser. No. 544,235
Int. Cl.[2] H04M *3/24*
U.S. Cl. 179—175.2 R **12 Claims**



1. A test circuit for testing call connections established through a switch network of a switching system, said test circuit comprising

means for applying a test tone signal simultaneously to both a transmit and receive path comprising one of the call connections, and

means responsive to said tone applying means for detecting path reversals occurring in the call connections and for enabling the switching system to establish another call connection in accordance with a predetermined value of reflected impedance of the call connection denoting a transmit and receive path reversal.

3,937,909
MULTIPLE CONTACT SWITCH

Jack L. Warren, P.O. Box 5784, Reno, Nev. 89502

Filed Nov. 1, 1974, Ser. No. 520,346
Int. Cl.[2] H01H *15/00*
U.S. Cl. 200—16 C **5 Claims**

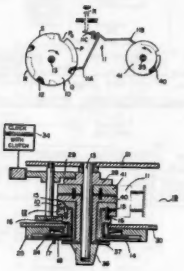
1. A multiple contact switch comprising a housing, a sliding contact bar mounted in said housing and connected to an external source of power, means extending into said housing for reciprocating said contact bar, a pair of contact posts mounted in closely adjacent but spaced apart relation in said housing and having external electrical connections, a ball adapted for contact with either of said contact posts selectively, said contact bar engaging said ball to move said ball from contact with one of said contact posts to contact with the other of said contact posts and thus establish a connection between the contact bar, the external source of power, the contact posts and the external connections, and means extending into said housing engaging said contact bar for biasing said contact bar into engagement with said ball.

3,937,910

TIMER HAVING A VARIABLE OPERATION PERIOD

Tadashi Fukami, Kawasaki, Japan, assignor to Jeco Kabushiki Kaisha, Japan

Filed Apr. 16, 1974, Ser. No. 461,291
Int. Cl.² H01H 7/08
U.S. Cl. 200—35 R 11 Claims



1. In a timer the combination comprising a frame, a clock motor, a drive train driven by the clock motor and having a slow cam and a fast cam, the slow cam being in the form of a disc having a plurality of notches equally spaced thereon, a slow cam follower movably mounted on the frame and responsive to the arrival of a notch in the cam, a shielding disc adjacent the slow cam and rotatable therewith, the shielding disc having a plurality of lobes of differing arcuate spacing and indexable with respect to the slow cam between a plurality of successive phase positions in which the lobes selectively shield thereby to activate the only desired ones of the notches for response by the slow cam follower, the fast cam having a notch, a fast cam follower movably mounted on the frame and responsive to arrival of such notch, control means operated jointly by the cam followers so that the control means is actuated to initiate a turn-on cycle only when both cam followers respond by dropping into respective notches, the slow cam being provided with a pointer, a time scale for cooperating with the pointer, the time scale being stationary but adjustably positionable on the frame to set the time that a turn-on cycle is initiated, the motor having a clutch to enable manual rotation of the drive train so that the pointer and associated cams are synchronized with the time scale.

3,937,911

CIRCUIT BREAKER FOR SMALL SIZE MOTORS

Kenichi Mabuchi, and Kogiro Komatsu, both of Tokyo, Japan, assignors to Mabuchi Motor Co. Ltd., Tokyo, Japan

Filed Apr. 29, 1974, Ser. No. 464,939
Int. Cl.² H01H 3/16; A63H 33/26; H02K 23/60
U.S. Cl. 200—61.39 4 Claims

1. A circuit breaker for a battery powered motor, in which the motor, the rotor shaft bearing and the affixed stator are rotatably supported by a fixed member, the circuit breaker being electrically connected between the motor and the battery, the circuit breaker comprising:

a first electrical contact adjustably fixed to the fixed member;

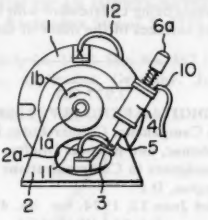
a second electrical contact movable into engagement with said first contact in response to rotation of the stator in a first direction;

biasing means urging the second contact to disengage from the first contact and urging the bearing in a second direction opposite to said first direction;

a spring acting on said second contact to urge the disengagement of said first and second contacts from each other; and

a stopper engaged with said second contact and carried by the stator and urged thereby into engagement with said first contact by the rotation of the bearing in said first direction;

whereby the stator is rotated in the first direction by motor



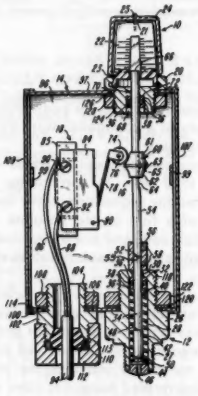
reaction torque, and the second contact engages with the first contact to connect the motor to the battery when the reaction torque is above a predetermined value, the charge remaining in the battery being also above a predetermined value.

3,937,912

PRESSURE RESPONSIVE CIRCUIT CONTROL UNIT HAVING ADJUSTABLE, INTERCHANGEABLE ACTUATOR COMPONENTS AND CAM-OPERATED SWITCH

Clyde J. Martin, Cincinnati, Ohio, assignor to Martin Industries, Inc., Cincinnati, Ohio

Filed Sept. 30, 1974, Ser. No. 510,435
Int. Cl.² H01H 35/38
U.S. Cl. 200—82 C 12 Claims



1. Combination pressure actuated switch and gauge, comprising: a housing having aligned openings in opposite, spaced walls thereof; a pressure responsive device mounted in the opening in one wall and including a body having a bore therethrough and a reciprocable pressure responsive member in the bore including a rod portion extending out of the bore and into the housing; a pressure indicating scale mounted in the opening in the other wall and extending exteriorly of the housing and having a bore therein aligned with the bore in said body; an elongate actuator stem within the housing having one end thereof secured to the rod in coaxial, justaposed relationship therewith for movement with the rod, the other end of the actuator stem slidably extending into the bore in the scale and cooperable therewith to indicate pressure sensed by the pressure responsive member; cam means secured on the actuator stem between the ends thereof; and electrical switch means

disposed within said housing and including switch actuator means situated in the path of movement of the cam means so as to be actuated thereby upon predetermined movement thereof.

3,937,913

SEALED PUSH-BUTTON CONTROL APPARATUS

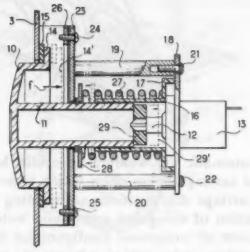
Jacques Soulas, St-Remy-Les-Cheureuse, and Paul Vilella, Chilly Mazarin, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 18, 1973, Ser. No. 425,786

Claims priority, application France, Dec. 18, 1972, 72.45034

Int. Cl.² H01H *3/12, 9/04*

U.S. Cl. 200—302 **4 Claims**



1. A push-button apparatus for actuating out-door equipment disposed within an equipment housing, comprising a push-button having a cap-shaped part protruding through a hole in the equipment housing from inside toward the outside thereof and a cylindrical part projecting from the central portion of the inside surface of said cap-shaped part, the inside of said equipment housing including a hollow cylindrical member fixed with respect to said equipment housing and positioned to slideably engage said cylindrical part of said push-button, a collar fixed to the cylindrical part of said push-button and a spring disposed between said collar and said hollow cylindrical member for biasing said push-button in a direction toward the outside of said equipment housing, wherein said hollow cylindrical member is fixed with respect to said equipment housing by means including a clevis secured to said housing, a plate contacting said hollow cylindrical member and a plurality of rod-shaped supports secured between said plate and said clevis.

3,937,914

METHOD AND APPARATUS FOR MANUFACTURING WELDED METAL TUBES OF FINITE LENGTH

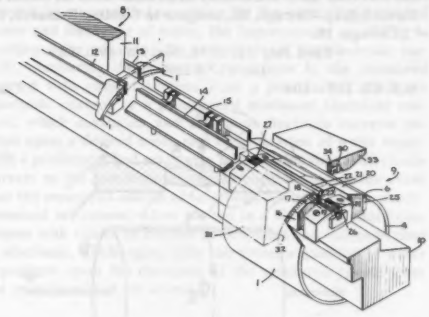
George T. Larson, Port Chester, N.Y., and Richard Hartmann, Jr., Trumbull, Conn., assignors to Thermatool Corporation, Stamford, Conn.

Filed Aug. 2, 1974, Ser. No. 494,035

Int. Cl.² B23K *31/06*

U.S. Cl. 219—67 **9 Claims**

1. Apparatus for welding together a pair of metal portions at their edges, each of said portions having an edge face and a major surface adjacent and extending transversely to said edge face, said apparatus comprising a welding station comprising welding means for welding said portions together, said welding means comprising an elongated proximity conductor, means for connecting one end of said proximity conductor to a first portion of each of said metal portions at the edge face thereof, contact means for engaging a second portion of each of said metal portions at the edge face thereof and means for supplying electrical welding current to said contact means and to the other end of said proximity conductor, holding means for receiving, engaging and supporting said portions including means for engaging the edge face of one of said portions and positioning said last-mentioned edge face in predetermined spaced relation to said proximity conductor with said last-mentioned edge face substantially parallel to the length of said proximity conductor and for thereafter holding said last-men-



tioned edge face in said predetermined relation to said proximity conductor while pressing the edge face of the other of said portions against said edge face of said one portion when the latter is positioned in said predetermined relation, and loading means for engaging said metal portions and delivering said metal portions to said holding means.

3,937,915

METAL WORKING METHOD USING ELECTRIC ARC AND JET GAS AND THE APPARATUS THEREFOR

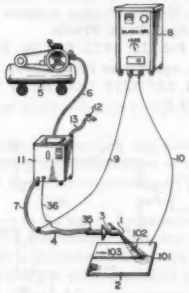
Koziro Matsuo, Yamatokoriyama; Kozi Ishihara, Hirakata, and Masonori Maeda, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 18, 1973, Ser. No. 425,802

Claims priority, application Japan, Dec. 19, 1972, 47-127865; Feb. 13, 1973, 48-18075; May 17, 1973, 48-58629[U]

Int. Cl.² B23P *1/00*

U.S. Cl. 219—68 **16 Claims**



1. A metal working method for removing a portion of a metal work piece, comprising the steps of: generating an electric arc between an electrode bar and the metal work piece; heating and melting a portion of the metal work piece with the arc; discharging, during the step of heating and melting, a non-combustible gas in the form of a jet gas to the heated and molten portion of the metal work piece and the surrounding environment of the portion for blowing off the molten portion; mixing a non-combustible liquid in the non-combustible compressed gas; discharging the non-combustible liquid together with the non-combustible gas to form a jet spray; and supplying the jet spray to the molten portion of the

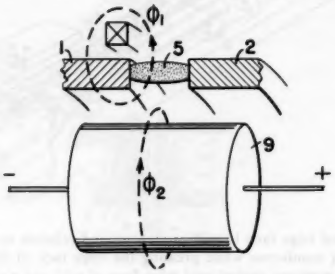
metal work piece and the surrounding environment of the portion.

3,937,916

ROTATING ARC WELDING METHOD AND APPARATUS

David Sciaky, Chicago, Ill., assignor to Welding Research, Inc., Chicago, Ill.

Filed July 22, 1974, Ser. No. 490,306
Int. Cl.² B23K 9/08
U.S. Cl. 219—104 7 Claims



7. A method for welding two parts along their adjacent edges comprising the steps of;

clamping the two parts to be welded so that their adjacent edges are separated by a gap;

causing an electric arc to be produced across the said gap;

generating a radial magnetic field between the said edges for causing the arc to move along said edges;

generating a second magnetic field concentric to said parts between the said edges to cause the said arc to be urged in a radial direction while being propelled by the first mentioned magnetic field so that the arc describes a spiral motion;

controlling the arc current so that it follows a predetermined program of arc current with respect to time; and,

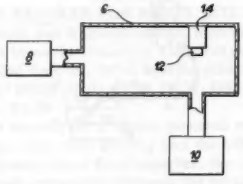
pressing the said parts together at the said edges.

3,937,917

METHOD FOR PRODUCING AND HEATING A PLASMA

Terenzio Consoli, Meylan, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 22, 1973, Ser. No. 334,897
Claims priority, application France, Mar. 6, 1972, 72.07756
Int. Cl.² B21B 1/00; H05B 7/00
U.S. Cl. 219—121 P 8 Claims



1. A method for producing and heating a plasma, comprising the steps of:

locating non-ionized solid material from which the plasma is to be obtained within a superconducting resonant cavity structure;

storing microwave-frequency electromagnetic energy in said superconducting resonant cavity structure; and then

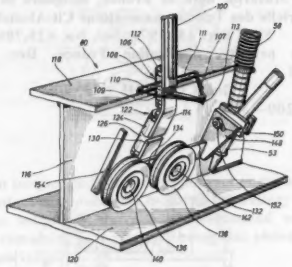
pre-ionizing said solid material to create an absorbent load into which the previously-stored electromagnetic energy is discharged to thereby produce said plasma and heat said produced plasma.

3,937,918

BEAM CARRIAGE TYPE AUTOMATIC ARC WELDING APPARATUS WITH WELDING HEAD TRACKING MECHANISM

Paul E. Robertson, 811 Creager St., Houston, Tex. 77034

Filed July 22, 1974, Ser. No. 490,762
Int. Cl.² B23K 9/12
U.S. Cl. 219—125 R 27 Claims



1. In automatic arc welding apparatus having a generally horizontal carriage beam upon which is mounted a movable welding carriage that positions arc welding heads for causing the formation of elongated compound welds in work pieces having joints of compound configuration between angularly related portions to be welded, wherein the improvement comprises:

connecting shaft means extending from said welding carriage;

guide means being provided on said welding carriage and providing guiding support for said connecting shaft means;

compound connection means being provided on said connecting shaft means, said compound connection means including a first pivotal connection defining a first axis that is substantially parallel with said connecting shaft means and a second pivotal connection that defines a second axis that is in inclined relation to said first axis;

at least one joint tracking means being supported by said compound connection means and being positioned for contact with the angularly related portions of said work piece; and

welding head means being connected to said joint tracking means and having a welding nozzle thereof positioned immediately adjacent the joint between said angularly related portions to be welded, whereby deviation of said joint causes pivotal movement of at least one of said pivotal connection means.

3,937,919

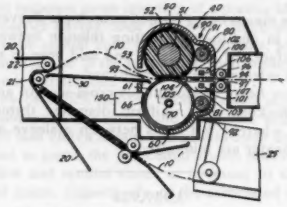
FIXING DEVICE

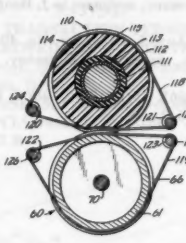
Henricus P. M. Clerx, Baarlo; Pieter M. J. Extra, Belfeld; Leonardus L. M. Keursten, and Franciscus M. J. Peeters, both of Grubbenvorst, all of Netherlands, assignors to Ocevan der Grinten N.V., Venlo, Netherlands

Filed Oct. 30, 1973, Ser. No. 411,291
Claims priority, application Netherlands, Nov. 8, 1972, 7215064; Sept. 17, 1973, 7312749
Int. Cl.² H05B 1/00
U.S. Cl. 219—216 32 Claims

1. Device for fixing a thermoplastic powder image on a support, comprising an elastic roller that is to contact the image side of the support and a substantially rigid roller having a surface sufficiently rigid to hold its shape under pressure against said elastic roller, said rollers together forming a nip through which the support is transported, the elastic roller comprising an elastically pliable annular body the outer surface of which is provided with at least one circumferential

formation lying radially away from the contour thereof, and a separating organ complementary to and coacting with each said formation to assure separation of the support from said





surface, each said formation being of such dimensions and said surface being sufficiently pliable that each said formation is deformed elastically by pressure of said rigid roller so as to form an even elastic roller surface in said nip.

3,937,920
METHOD OF OPERATING AN ELECTRODE-TYPE WATER-VAPOR GENERATOR

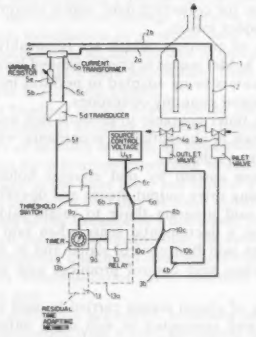
Siegbert Gundacker, Reinach, and Gerhard Badertscher, Bolligen, both of Switzerland, assignors to Plascon AG., Munchenstein, Switzerland

Filed Feb. 4, 1974, Ser. No. 439,468

Claims priority, application Switzerland, Mar. 9, 1973, 3469/73

Int. Cl.[2] H05B *1/02*, *3/60*; H01C *10/02*

U.S. Cl. 219—286 **10 Claims**



1. An improved method of operating a water-vapor generator comprising a vaporization vessel containing water and having electrodes which are connected to a current supply and between which flows a current whose magnitude depends on the depth of immersion of the electrodes in the water in the vessel, the method comprising discharging water from the vessel from time to time in order to reduce the concentration of minerals resulting from the vaporization, introducing fresh water into the vessel in order to replace water that has been evaporated and discharged, and employing the electrode current as a controlled condition for the control of supply of water and discharge of water, the improvement consisting in continuously measuring the magnitude of the electrode current, comparing the course of variations in the measured current with respect to time from a preselected maximum electrode current to a preselected minimum electrode current, which maximum and minimum electrode currents depend upon a desired mean rate of generation of water vapor, with a predetermined set course from the maximum electrode current to the minimum electrode current, and in the event that the measured course of variations lies beneath the predetermined set course, when plotted in a Cartesian coordinate system with values of current as ordinates and values of time as abscissae, discharging from the vessel a quantity of water dependent upon the deviation of the measured course from the predetermined set course.

3,937,921
TEMPERATURE CONTROL SYSTEM

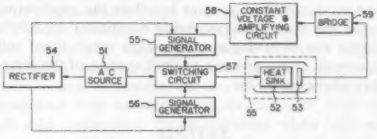
Katsushi Furuichi, Yokohama; Kenji Kurita; Yoshimasa Kimura, both of Kawasaki, and Hisashi Sakamaki, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 17, 1974, Ser. No. 461,796

Claims priority, application Japan, Apr. 19, 1973, 48-44440; Apr. 19, 1973, 48-44441; May 30, 1973, 48-60622; May 30, 1973, 48-60624

Int. Cl.[2] H05B *1/02*

U.S. Cl. 219—494 **17 Claims**



1. A temperature control system comprising:

a heat sink;

an AC power source for heating said heat sink;

means for detecting the temperature of said heat sink and to generate a signal corresponding to the detected temperature;

means, responsive to the signal, for generating a first control signal when the temperature detected by said detecting means is under a predetermined temperature;

means for generating a second control signal to supply a partial power of said AC power source to said heat sink when the temperature detected by said detecting means reaches the predetermined temperature;

means responsive to at least one of said, first and second control signals for controlling the supply of power from said power source to said heat sink;

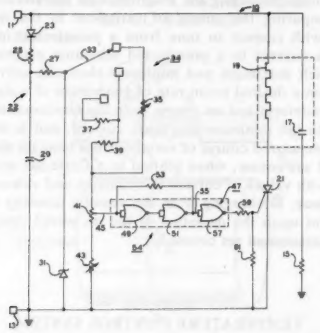
whereby said heat sink is supplied with full power from said AC power source in response to said first control signal when the temperature detected by said detecting means is under the predetermined temperature, and said heat sink is supplied with the partial power from said AC power source in response to said second control signal when the temperature detected by said detecting means reaches the predetermined temperature.

3,937,922

CONTROL SYSTEM

David C. Hamstra, Clinton, Iowa, assignor to General Electric Company, Fort Wayne, Ind.

Filed Aug. 27, 1974, Ser. No. 500,947
Int. Cl.² H05B 1/02
U.S. Cl. 219—501 19 Claims



1. A control system having means for changing temperature in an enclosed space to maintain it generally near a selected value comprising;

means electrically energizable for enabling the temperature changing means;

means for electrically indicating variations of the temperature in the enclosed space from the selected value; and

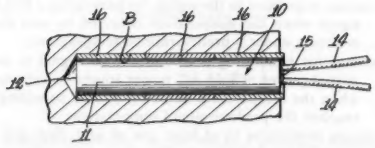
bistable means responsive to the indicating means and coupled to the enabling means for respectively effecting actuation and de-actuation of the temperature changing means when the temperature in the enclosed space varies from the selected value by one of a first predetermined amount in excess of the predetermined value and a second predetermined amount less than the predetermined value, the bistable means being constituted by a Schmitt trigger circuit having output voltage versus input voltage hysteresis characteristics to limit cycling of the temperature changing means.

3,937,923

ELECTRIC CARTRIDGE HEATER WITH METAL SLEEVE ADAPTER

Herman P. Smith, Monroeville, Pa., assignor to Emerson Electric Company, St. Louis, Mo.

Filed Apr. 28, 1975, Ser. No. 572,054
Int. Cl.² H05B 3/06
U.S. Cl. 219—523 5 Claims



1. In combination:

an electric cartridge heater having a metal sheath of a predetermined outside diameter and adapted to have its external wall surface closely fit the wall of a bore in a mass to be heated,

means for adapting said cartridge heater to fit in heat transfer relationship within a bore of larger diameter, comprising metal sleeve means having an inside diameter to provide an inside wall surface to closely fit the sheath exterior wall surface, and having an outside diameter to provide an exterior wall surface to closely fit the wall surface of said larger bore,

said cartridge heater being produced in various sheath lengths,

said sleeve means being formed as multiple sleeves disposed serially in end-to-end abutting relation between facing wall surfaces of said sheath and said bore in number to cover a selected sheath length, and

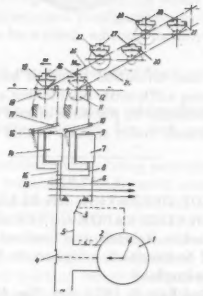
each sleeve being of continuous cross-section and of constant thickness and uniform diameter throughout its length, whereby hot spots between a sleeve and a cartridge heater are minimized.

3,937,924

SYSTEM FOR COLLECTING DATA

Kurt Wilhelm Kratt, Aldingen, and Alois Bolsinger, Spaichingen, both of Germany, assignors to J. Hengstler K.G., Aldingen, Germany

Filed Aug. 5, 1974, Ser. No. 494,570
Claims priority, application Germany, Aug. 16, 1973, 2341284
Int. Cl.² G06K 15/18, 7/00, 19/04; G06F 7/38
U.S. Cl. 235—61.6 R 32 Claims



1. A system for collecting data, which comprises

counter holder means,

a plurality of counters, which are removably held by said counter holder means at predetermined locations, each of said counters being adapted to perform incremental and decremental counting operations,

a program timer operable to produce first and second control signals in alternation in accordance with a predetermined time schedule,

drive means carried by said counter holder means and comprising drive output means and operable under control of said program timer to rotate said drive output means in a decremental sense when said control timer produces said first control signal and in an incremental sense when said control produces said second control signal,

a plurality of clutch means carried by said counter holder means and connected to said drive output means and associated each with one of said counters, each of said clutch means being adapted to assume a first state for driving the associated counter in an incremental sense and a second state for driving the associated counter in a decremental sense,

a plurality of code detectors, each of which is associated with one of said counters and comprises code detector elements and is adapted to receive an identification code carrier in a predetermined position and to assume a first state in response to an insertion of a mating identification code carrier having code elements, which represent the same code as said code detector elements, and a second state in response to the removal of such mating identification code carrier, and

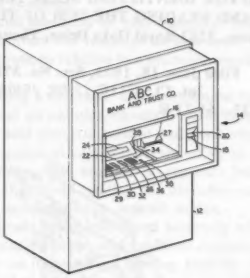
a plurality of clutch-shifting means, which are carried by said counter holder means and associated with respective ones of said clutch means and of said code detectors and adapted to cause the associated clutch means to assume said first and second states in response to the first and second states, respectively, of the associated code detector.

3,937,925

MODULAR TRANSACTION TERMINAL WITH MICROPROCESSOR CONTROL

William A. Boothroyd, San Jose, Calif., assignor to IBM Corporation, Armonk, N.Y.

Filed June 25, 1974, Ser. No. 482,860
Int. Cl.² G06K *17/00*; G06F *7/00*
U.S. Cl. 235—61.7 B **20 Claims**



1. A flexible, modular transaction execution terminal comprising:

an information bus for carrying data signals and bus access control signals which control the transfer of bus data signals between the bus and an adapter unit connected to the bus;

a programmable processor unit connected to the bus, the processor unit including program storage and electrically alterable random access storage operable under control of program information to generate data signals on the bus for commanding an adapter unit to perform a specific operation, to receive data information from the bus, and to generate bus control signals;

a document handling system connected to the information bus, the document handling system including storage for a plurality of issuable articles, an issue port, a transport mechanism for selectively conveying issuable documents from storage to the issue port, and control circuitry connected to control a plurality of issue system operations with pertain to the issuance of a document in response to data signals received from the bus, the control circuitry further generating document issue subsystem status information for communication as a bus data signal upon command; and

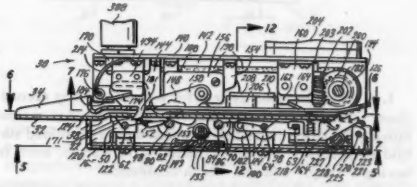
a user communication sybsystem including means for receiving information from a user, and means for conveying information messages to a user, the user communication subsystem including control circuitry connected to control a plurality of communication subsystem operations which pertain to the conveyance of an information message to a user in response to bus data signals and connected to generate user communication subsystem status information indicative of information received from a user for communication as a bus data signal upon command.

3,937,926

VALIDATOR FOR SCRIP

Thaddeus M. Jones, South Bend, Ind.; Hasmukh R. Shah, and Charles D. Nash, both of Hot Springs, Ark., assignors to UMC Industries, Inc., New York, N.Y.

Filed Jan. 10, 1974, Ser. No. 432,429
Int. Cl.² G06K *7/14*, *19/06*, *5/04*
U.S. Cl. 235—61.7 R **29 Claims**



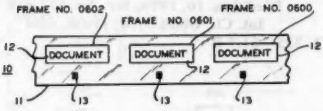
1. A validator which comprises sensing means that senses a plurality of patterns on a document in a predetermined sequence to effect the developing of sensed data, recognition means responsive to the developing of said sensed data to provide a plurality of logic level signals, a preprogrammed memory which is an electronic memory and thus has no moving parts and which contains pre-programmed data hard-wired therein, said hard-wired pre-programmed data corresponding to said plurality of patterns on said document, said pre-programmed memory holding said pre-programmed data as a plurality of discrete groupings of pre-programmed data in the form of predetermined logic level signals, one of said groupings of pre-programmed data corresponding to the logic level signals which said recognition means develops when said sensing means senses a predetermined one of said plurality of patterns on said document, another of said groupings of pre-programmed data corresponding to the logic level signals which said recognition means develops when said sensing means senses a predetermined succeeding one of said plurality of patterns on said document, said one and said other groupings of said pre-programmed data being stored within said pre-programmed memory in a manner which permits said one and said other groupings of said pre-programmed data to be read in the same sequence in which said predetermined one and said predetermined succeeding one of said patterns on said document are sensed by said sensing means, a comparing means that can compare said logic level signals which said recognition means develops when said sensing means senses said predetermined one and said predetermined succeeding one of said plurality of patterns on said document directly with said predetermined logic level signals while said predetermined logic level signals are stored within said pre-programmed memory, further means to effect sequential comparing by said comparing means of said logic level signals, developed by said recognition means during the sensing of said predetermined one and of said predetermined succeeding one of said patterns by said sensing means, with said predetermined logic level signals which constitute said pre-programmed data within said pre-programmed memory, and additional means to effect validation of said document if said sensed data obtained during the sensing of said predetermined one and of said predetermined succeeding one of said patterns by said sensing means corresponds in nature and in sequence with said pre-programmed data within said pre-programmed memory.

3,937,927

FRAME LOCATION SYSTEM

Hans Weigert, Woodcliff Lake, N.J., assignor to Ragen Precision Industries, Inc., North Arlington, N.J.

Filed June 21, 1974, Ser. No. 481,556
Int. Cl.² G03B 23/12; G06K 7/10; G06G 7/28
U.S. Cl. 235—61.11 R 10 Claims



1. A frame location system for use with a strip record medium retrieval device of the type that includes means for moving the strip record medium past a predetermined station, said strip record medium containing *m* frames, each frame having a unique address, which comprises:

a first reversible counter having a counting capacity of *m* pulses for storing the address of a selected frame to be moved to said predetermined station and generating an overflow signal when the accumulative count applied thereto exceeds *m*;

a second reversible counter having a counting capacity of *m* pulses for storing the address of the frame presently at said predetermined station and generating an overflow signal when the accumulative count applied thereto exceeds *m*;

a third reversible counter, having a counting capacity of *m* pulses connected to said first and second reversible counter, for determining the difference between the addresses stored therein;

means responsive to the application of a start search command from an external source, for generating a burst of *m* pulses;

means for connecting the output of said pulse generating means to the up-count inputs of said first and second reversible counters to cause said counters to overflow;

logic means, connected to said first and second reversible counters, for routing pulses from said burst of pulses to the up-count input of said third reversible counter upon receipt of a first overflow signal from either said first or said second reversible counter and for terminating the same upon receipt of a second overflow signal from either said second or said first reversible counter; and

means, responsive to said address difference, for actuating said strip record moving means, whereby said selected frame is presented at said predetermined station.

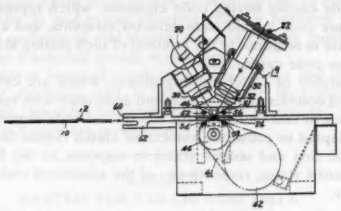
3,937,928

EMBOSSED CARD READER

Takehiko Sasaki, Yamatokoriyama; Keizo Yamamoto, Nara, and Hiroaki Fukuda, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 15, 1974, Ser. No. 460,900
Int. Cl.² G06K 7/10; G08C 9/06; G06K 9/00
U.S. Cl. 235—61.11 E 12 Claims

1. An embossed card reader comprising a table for providing support for an embossed card to be read, means for transporting the embossed card along the table, a slit plate disposed over said table, said slit plate being provided with an incident light slit and a reflection light slit, a source of light for irradiating the surface of the embossed card through the incident light slit of the slit plate to produce a parallel light beam, and light-responsive means for detecting light reflected from the surface of the embossed card and passed through the reflection light slit of the slit plate, said parallel light beam enabling the simple and accurate reading of information contained on the embossed card.

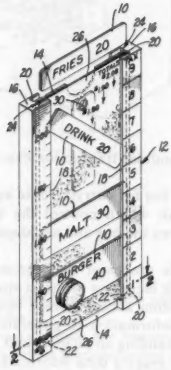


3,937,929

METHOD FOR IDENTIFYING SELECTED INVENTORY ITEMS AND READING THE SUM OF THEIR VALUES

Peter Knauer, 3223 Royal Oaks Drive, Thousand Oaks, Calif. 91360

Filed June 18, 1973, Ser. No. 371,125
Int. Cl.² G11C 15/00, 19/06
U.S. Cl. 235—61.11 R 1 Claim



1. A method of inventory distribution and control utilizing a plurality of coded elements separated from and corresponding to one of a predetermined inventory of items, each element being identity coded to provide a first indicium thereon representing the corresponding inventory items, and magnitude coded to provide a second indicium thereon indicating a predetermined magnitude associated with the corresponding inventory item, and utilizing a holding member for retaining together a group of said coded elements, said method comprising the steps of:

selecting a predetermined group of said elements;

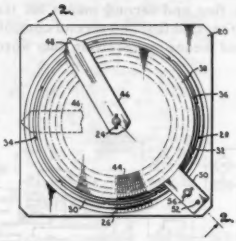
positioning said predetermined group of elements in cooperative relationship on said holding member; and

sensing the indicia on said predetermined group of elements to identify their corresponding inventory items and to read the sum of their magnitudes.

3,937,930
ROTARY SLIDE RULE FOR TOPOGRAPHIC CALCULATIONS

Frank J. Thomas, Box 5262 Hicrest Station, Topeka, Kans. 66605

Filed Dec. 17, 1973, Ser. No. 425,562
Int. Cl.² G06C 27/00, 3/00
U.S. Cl. 235—78 R 11 Claims



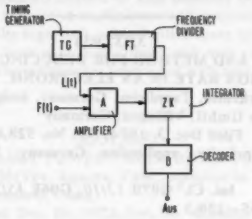
1. A rotary topographic calculator comprising:
a baseplate having an annular scale graduated to indicate a range of rod readings;
a conversion unit mounted on said baseplate and operable to directly convert rod readings on said scale into corresponding elevations relative to a predetermined reference elevation,
said unit including a rotatable disc component coaxial with said scale, and an annular elevation scale concentrically arranged on said disc component and graduated to cover a range of numerical values corresponding to said range of rod readings, like angular increments between the graduations of said rod reading and elevation scales being equal to the same distance on both scales,
said elevation scale being numbered inversely with respect to said rod reading scale, and said disc component being rotatable to an operational setting radially aligning a predetermined rod reading with the numerical value on said elevation scale corresponding to a known elevation, whereby other rod readings may be directly converted into corresponding elevations by reading the aligned numerical values on the elevation scale or, conversely, elevations may be converted into rod readings;
a rotatable disc member carried by said baseplate and coaxial with said disc component; and
an annular depth scale concentrically arranged on said disc member and graduated to indicate depth of cut and depth of fill in progressively increasing amounts in opposite directions away from a zero mark, the angular increments between the graduations of said depth scale being equal to the same units of measurement as like angular increments on said rod reading and elevation scales,
said disc member being rotatable to a position radially aligning said zero mark with a selected rod reading or elevation, whereby the depth scale then indicates the cut or fill at other corresponding radially aligned elevations.

3,937,931
PROCEDURE TO DETERMINE THE TEMPORAL MEAN OF A QUANTITY TO BE MEASURED, AS A FUNCTION OF ITS PERIOD OF OPERATION

Gerhard Stumpner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 28, 1971, Ser. No. 184,553
Claims priority, application Germany, Sept. 30, 1970, 2048149
Int. Cl.² H03K 21/36; G06M 3/04
U.S. Cl. 235—92 EC 2 Claims

1. A method for measuring the time mean of a quantity being measured as a function of its period of operation, comprising the steps of:
applying the quantity being measured to an integrator,
producing a constant extinguishing quantity which is a function of at least two predetermined pairs of values for said time mean and the integration period of the quantity being measured and which is of a value such that the

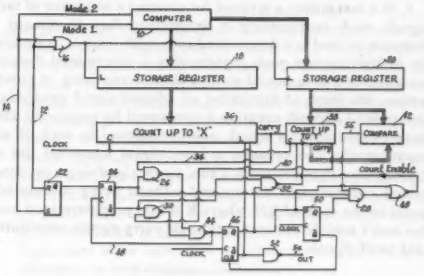


storage capacity of said integrator is uniform for said predetermined pairs of values for said time mean and the integration period of the quantity being measured,
superimposing said extinguishing quantity on said quantity being measured and
generating a signal from the values stored in said integrator responsive to the exceeding of said value pairs.

3,937,932
DIGITAL FREQUENCY GENERATOR

Joseph R. Ahlgren, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Apr. 15, 1974, Ser. No. 461,094
Int. Cl.² H03K 21/36
U.S. Cl. 235—92 PE 6 Claims



1. A two-mode digital pulse generator producing a selectable frequency output determined by a controlling computer, said computer also selecting the mode of operation depending on the selected frequency comprising:
a. storage means for receiving a multiple bit binary number in parallel from said computer;
b. means for producing clock pulses;
c. means for counting said clock pulses and producing a carry signal when counting capacity is exceeded including first and second counters each producing a carry signal when they overflow; the carry signal of the 1st counter incrementing the second counter;
d. means tranferring said binary number into both of said counters in a first mode and a portion of said number into only the 1st counter in a second mode to preset the initial value at which counting begins;
e. means responsive to the second counter carry signals in said first mode and to the first counter carry signals in said second mode for producing said output pulses at the selected frequency;

f. comparison means operative in said second mode for repetitively comparing the value of the second counter against the untransferred protion of said binary number in said storage means to produce an inhibit output indicative of the need for counting inhibition to maintain the selected frequency output;

g. logic means receiving said inhibit output, in the second mode, for inhibiting counting for a predetermined period to effect correction of the output pulse frequency.

3,937,933

SYSTEM AND METHOD FOR REDUCING THE PULSE REPETITION RATE IN AN ELECTRONIC TAXI METER

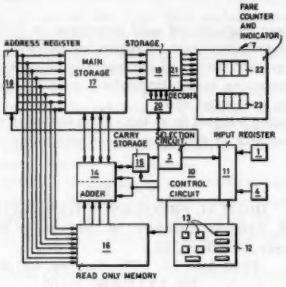
Ulrich Warkentin, Tannheim, Germany, assignor to Kienzle Apparate GmbH, Villingen, Germany

Filed Dec. 3, 1974, Ser. No. 528,820

Claims priority, application Germany, Dec. 5, 1973, 2360587

Int. Cl.[2] G07B 13/10; G06F 15/20

U.S. Cl. 235—150.3 3 Claims



1. In a taxi meter, a method for creating a sequence of tariff signals each representing a determined fare increment in response to, and in a determined ratio with respect to a plurality of input pulses each representing a determined distance travelled or a determined waiting time, comprising, in combination, the steps of furnishing an addend signal signifying a determined addend; creating a sum signal by sequential additions of said addend signal, one in response to each of said input signals; and creating a carry signal whenever the so-created sum signal exceeds a sum signal signifying a predetermined number, said determined addend being substantially equal to the ratio of K/T where K is said predetermined number and T said determined ratio, said carry signals constituting said tariff signals.

3,937,934

SYSTEM AND METHOD FOR OPERATING A STEAM TURBINE WITH DIGITAL CONTROL HAVING VALIDITY CHECKED DATA LINK WITH HIGHER LEVEL DIGITAL CONTROL

Klaus Pasemann, Martin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

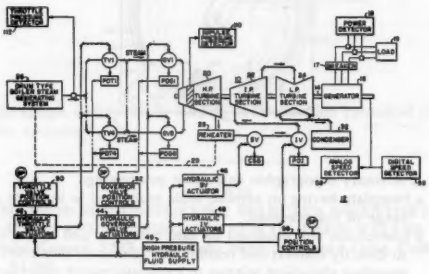
Continuation of Ser. No. 247,884, April 26, 1972, abandoned.

This application Dec. 21, 1973, Ser. No. 427,281

Int. Cl. F01d 17/02; G05b 15/00; G06f 15/06

U.S. Cl. 235—151.21 4 Claims

1. A system for operating a steam turbine in an electric power plant, said system comprising an arrangement of throttle and governor valves for supplying steam to the turbine, means for actuating said valves to position said valves in accordance with valve position signals, means for generating signals representative of the turbine speed and the turbine load, a first digital controller having means for generating a speed setpoint and means for generating a load setpoint, said first controller including a speed control for generating valve position signals in response to the turbine speed signal and speed setpoint during turbine startup, said first controller further including a load control for generating valve position signals in response to the turbine load signal and load setpoint during turbine load operation, means for generating signals representative of additional turbine parameters and for coupling the additional signals to said first controller, means for registering the additional signals in said first controller, a second digital controller, means for linking at least digital data signals between said controllers, said data link means including respective first and second means for transmitting data word signals from said first and second controllers, respective first and second means for receiving data word signals in said



first and second controllers, said second transmitting means including means for generating setpoint data control and data change word signals for transmittal to said first controller in one of the data link modes to modify at least one of the setpoints operative in said first controller, each of said transmitting means including means for generating a check signal related in a predetermined way to a predetermined group of transmitted digital data signals and each of said receiving means including means for generating a second check representation related in the same way to the group of transmitted data signals as received, and means for comparing the received check signal and the check representation and for generating an indication of a discrepancy between the two.

3,937,935

FAULT DETECTION PROCESS AND SYSTEM FOR A TIME-DIVISION SWITCHING NETWORK

Jean Pierre Le Pabic, Jean Pierre, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 6, 1974, Ser. No. 521,316

Claims priority, application France, Nov. 27, 1973, 73.42091

Int. Cl.[2] G06F 11/00

U.S. Cl. 235—153 AK 11 Claims

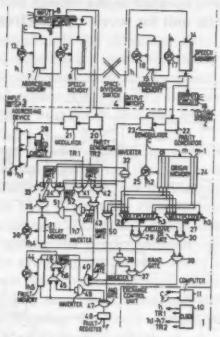
1. A fault detection process for detecting faults occurring in a time-division switching network comprising the steps of

inserting partial origin coded data into said switching network together with coded samples from an input time-division channel so that the address of said input time-division channel can be determined from said partial origin coded data;

storing the address of said time-division channel connected to an output time-division channel for the duration of a communication; and

comparing the address of said input time-division channel produced from said partial origin coded data received from an output of said switching network together with associated ones of said coded samples transmitted to said output time-division channel with said stored address

related to said input time-division channel connected to said output time-division channel to signal a fault upon



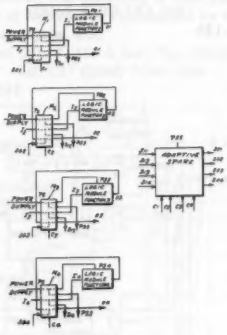
the occurrence of any difference between said produced address and said stored address.

3,937,936

EQUIPMENT SELF-REPAIR BY ADAPTIVE MULTIFUNCTION MODULES

James Saporito, Stamford, Conn., and Wolfgang W. Gaertner, Utica, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 14, 1975, Ser. No. 567,893
Int. Cl.² G06F *15/16;* H03K *19/00, 17/60*
U.S. Cl. 235—153 AE 7 Claims



1. An equipment self-repair apparatus utilizing adaptive multifunction modules comprising in combination:

a plurality of logic units having an input, an output, and power supply respectively,

a plurality of multiplexer units respectively connected to said plurality of logic units, said plurality of multiplexer units respectively controlling the input and the power supply connections to said plurality of logic units, said plurality of multiplexer units respectively controlling the output from said plurality of logic units, said plurality of multiplexer units respectively providing a control signal, and

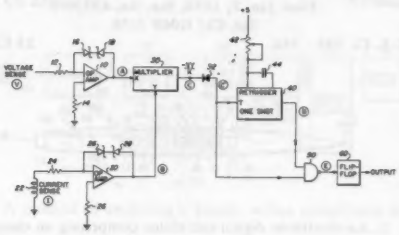
an adaptive spare unit connected respectively to each of said plurality of multiplexer units to receive said input and control signals therefrom, said adaptive spare unit providing a plurality of output signals respectively to said plurality of multiplexer units, said adaptive spare unit being substituted for one of said plurality of logic units when said respective multiplexer unit control signal indicates a faulty logic unit, said adaptive spare unit receiving the input from said faulty logic unit and providing an output to the multiplexer associated with said faulty logic unit.

3,937,937

PRIMARY POWER FAULT DETECTOR

Irvin Maurice McVey, Agoura, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 26, 1973, Ser. No. 428,602
Int. Cl.² H02H *3/26;* G06F *11/00*
U.S. Cl. 235—153 R 18 Claims



1. A power fault detection system comprising:

first means for detecting applied voltage and generating a voltage sensed signal, second means for detecting applied current and generating a current sensed signal, multiplier means for multiplying the voltage and current sensed signals, circuit means coupled to said multiplier means for generating predetermined width signals in response to the output from said multiplier means, and logic circuit means coupled to the output of the circuit means and the output of the multiplier means for detecting the logic level of said outputs, said logic circuit means remaining in a first logic state at an indication of power flowing in a first direction in said system and switching to a second logic state at an indication of power flowing in a second direction in said system.

3,937,938

METHOD AND APPARATUS FOR ASSISTING IN DEBUGGING OF A DIGITAL COMPUTER PROGRAM

Gordon H. Matthews, Dallas, Tex., assignor to Action Communication Systems, Inc., Dallas, Tex.

Filed June 19, 1974, Ser. No. 480,949
Int. Cl.² G06F *11/00*
U.S. Cl. 235—153 AK 57 Claims

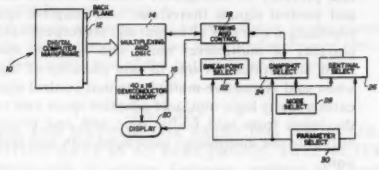
7. A system for assisting in the detection of errors and malfunctions in the operation of a programmed digital computer comprising:

means for exterior connection to the computer to receive representations of the program instructions executed by the computer,

a memory having a plurality of memory cells for sequentially storing a plurality of the representations of the program instructions,

circuitry responsive to a predetermined state of operation of the computer for controlling said memory such that a

plurality of the last program instructions prior to the occurrence of the predetermined state are stored in said memory cells, and



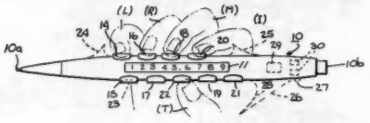
display means operable to selectively display representations of the program instructions stored in said memory cells.

3,937,939

SINGLE-HAND DIGITAL CALCULATOR

Marvin A. Frenkel, 26323 Hendrie Blvd., Huntington Woods, Mich. 48070

Filed Jan. 7, 1974, Ser. No. 431,499
Int. Cl.² G06F 7/38
U.S. Cl. 235—156 **15 Claims**



1. An electronic digital calculator comprising an elongated cylindrical tubular body; a plurality of input value setting keys mounted on and carried on the outer surface of said tubular body; a plurality of function keys mounted on and carried on the outer surface of said tubular body; a display readout screen mounted on said tubular body for visible scanning of the calculation being performed; an electronic chip housed within said tubular body and electrically connected to said value setting keys, said function keys, and said read-out screen; and, battery means housed within said tubular body for providing a source of electrical power to said electronic chip, said valve setting keys and said function keys being arranged on the outer surface of said tubular body such that they can be manually actuated by the fingers of one hand of a user while held in said hand.

3,937,940

DIRECT COMPARE IN AN ELECTRONIC DIGITAL CALCULATOR

George L. Brantingham, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

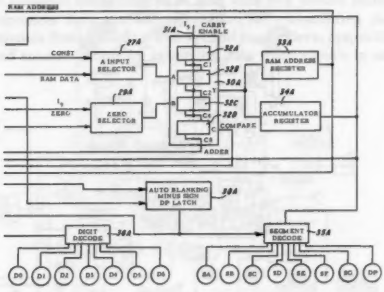
Filed Nov. 26, 1974, Ser. No. 527,456
Int. Cl.² G06F 7/02; G06F 7/50
U.S. Cl. 235—156 **14 Claims**

1. In an electronic calculator system having data storage means, an arithmetic unit including first and second input means and first and second cascaded half adder stages for performing operations on data applied to said input means and control circuitry including addressable instruction storage means for providing multi-bit commands at its output which define the operation of the system, a circuit arrangement for directly comparing selected bits of said instruction storage means with resultant data from said arithmetic unit comprising:

a. comparison means in said first half adder stage of said arithmetic unit coupled to the first and second input means for comparing data applied to said first input means with data applied to said second input means and generating a condition signal indicative of the results of the compaison;

b. means coupling first selected bits of a multi-bit command at the output of said instruction storage means directly to said first input means of said arithmetic unit;

c. register means coupled to the second half adder stage of said arithmetic unit for receiving data from said arithmetic unit;



d. means coupling said register means to the second input means of said arithmetic unit; and

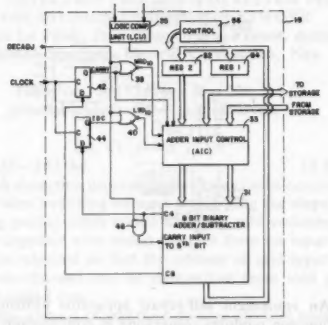
e. means coupled to second different selected bits of said multi-bit command at the output of said instruction storage means for controlling said comparison means to compare said first selected bits to the contents of said register means in accordance with a compare command defined by said second selected bits.

3,937,941

METHOD AND APPARATUS FOR PACKED BCD SIGN ARITHMETIC EMPLOYING A TWO'S COMPLEMENT BINARY ADDER

David Larry Zemel, Palo Alto, and Robert Gerald Kirk, Danville, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Nov. 27, 1974, Ser. No. 527,605
Int. Cl.² G06F 7/385
U.S. Cl. 235—159 **6 Claims**



1. A data processing system storing a BCD encoded number N and a BCD encoded number P which are operated upon in low to high order information bytes to form a decimal arithmetic sum and a decimal arithmetic difference where each

byte includes least and most significant decimal digits each encoded as four BCD bits, said system comprising,

a first unit for adding and for two's complementing operands, said unit including an eight bit adder having first and second inputs and having fourth and eighth bit carry outputs and a blocking input for blocking the fourth carry input to the fifth bit,

an input control unit for directing data to said first unit inputs and providing a predetermined translation value and plural predetermined adjust values,

a plurality of registers for storing operands including said BCD encoded number N and said BCD encoded number P,

a carry storage unit for storing the adder carry outputs,

control means for controlling the processing of operands,

means, responsive to said control means, for gating an information byte of number N from said registers to the first input of said adder and if the operands are to be added for gating the predetermined operand translation value to the second input of said adder to form a preconditioned sum and connecting said adder to said registers for storing said sum, and if the operands are to be subtracted for forming the two's complement of said information byte of N by said adder,

means, responsive to said control means, for gating said byte of N and byte of P from the respective registers and the carry from the carry storage to the first and second inputs of said adder to form an initial binary sum and connecting the adder output to said registers for storing said sum, and simultaneously storing the adder carry outputs in said carry storage,

means, responsive to said control means, for gating to said input control unit the contents of said carry storage to form an adjust value in a predetermined manner,

means, responsive to said control means, for gating the initial binary sum from said registers and the adjust value to the first and second inputs of said adder to form an adjusted sum, and gating said sum to said registers for storing said adjusted sum.

3,937,942

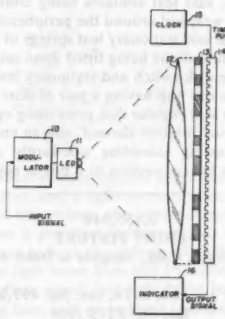
MULTI-CHANNEL OPTICAL CORRELATION SYSTEM

Keith Bromley, San Diego; Michael A. Monahan, Poway, and Richard P. Bocker, San Diego, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 1, 1974, Ser. No. 484,832

Int. Cl.[2] G06G 7/19, 9/00

U.S. Cl. 235—181 **5 Claims**



1. A multi-channel optical correlation system comprising:

a mask having a plurality of linearly disposed channels, each said channel having known recorded information defined by variations in opacity along its linear length;

a light source positioned to illuminate said mask;

means for modulating the intensity of said light source as a function of an input signal;

a multiple element, photo-responsive charge coupled device positioned to receive the light energy transmitted by the illuminated mask and having elements arrayed in linearly disposed groups along axes parallel to said linearly disposed channels for developing a charge within each said element commensurate with the photo energy received at its position;

a source of clock signals; and

means applying said clock signals to said charge coupled device for cumulatively shifting charges developed within each said linearly disposed group and generating a cumulative charge output for each said group indicative of its degree of correlation to said input signal.

3,937,943

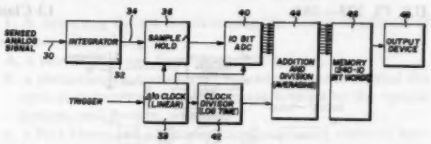
DIGITAL SIGNAL AVERAGER WITH LOGARITHMIC TIME BASE

Peter Debrunner, and Hans Frauenfelder, both of Urbana, Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Aug. 29, 1974, Ser. No. 501,798

Int. Cl.[2] G06G 7/18

U.S. Cl. 235—183 **9 Claims**



1. A method of analyzing a kinetic action comprising the steps of:

providing periodic digital samples of information sensed during said kinetic action; and

averaging said periodic digital samples of information over exponentially increasing time intervals to obtain measurements of said kinetic action over several time decades.

3,937,944

ELECTRONIC CIRCUITRY AND IN PARTICULAR TO CIRCUITRY FOR THE CROSS FEED CANCELLATION OF SECOND ORDER DISTORTION

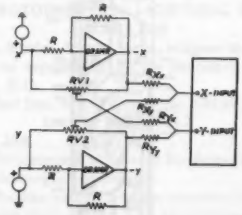
Robert Radzyner, 35 Culver St., Kogarah, New South Wales, and Warwick Harvey Holmes, 3 Bortfield Drive, Chiswick, New South Wales, both of Australia

Filed Dec. 14, 1973, Ser. No. 424,881

Claims priority, application Australia, Dec. 15, 1972, 1630/72

Int. Cl.[2] G06G 7/16

U.S. Cl. 235—184 **9 Claims**



1. A method for the reduction of undesired second and higher order distortion products present in the signal(s) w_1, $w_2, \ldots, w_M$ appearing at the M outputs of an imperfect nonlinear electronic device which has input signals $u_1, u_2, \ldots, u_N$ applied to its N inputs, where N is an integer greater than unity and M is an integer greater than zero, and where input u_n is

applied to the n-th input, n being an integer lying between 1 and N inclusive, which comprises the steps of:

incorporating cross-feed connections at the inputs of the non-linear electronic device, and

generating by use of the cross-feed connections signals $u_1'u_2', \ldots, u_N'$ from the input signals $u_1, u_2, \ldots, u_N$ such that at least one of the signals $u_1', u_2', \ldots, u_N'$ is a non-trivial function of at least two of the signals $u_1, u_2, \ldots, u_N$ and such that the signal u_N is a non-trivial function of at least the signal u_N, where n is an integer between 1 and N inclusive, and

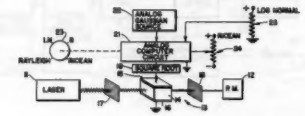
applying the signals $u_1', u_2', \ldots, u_N'$ to the N inputs of the electronic device instead of applying the input signals $u_1, u_2, \ldots, u_N$ directly to the N inputs so that the undesired second and higher order distortion products are reduced.

3,937,945

APPARATUS FOR SIMULATING OPTICAL TRANSMISSION LINKS

Michael W. Fitzmaurice, Gambrills, and Mona Tycz, Greenbelt, both of Md., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed June 25, 1974, Ser. No. 482,953
Int. Cl.² G06G 7/48; H04B 9/00
U.S. Cl. 235—184 **13 Claims**



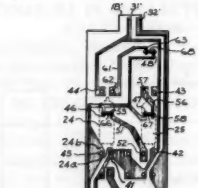
1. Apparatus for simulating a space-to-space or space-to-earth optical transmission link comprising a Gaussian random source, a computer responsive to the Gaussian random source for deriving an analog signal having random variations indicative of characteristics of the transmission link, and a linear optical modulator connected to be responsive to the analog signal and adapted to be positioned between an optical carrier source and a receiver for the carrier of the source, whereby light transmitted through the modulator is modulated in accordance with the random variations of the analog signal.

3,937,946

MULTIPLE FLASH LAMP UNIT

Kurt H. Weber, Pepper Pike, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 6, 1974, Ser. No. 448,671
Int. Cl.² G03B 15/02
U.S. Cl. 240—1.3 **21 Claims**



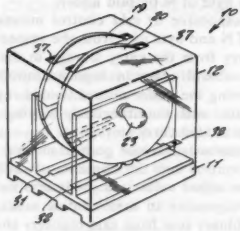
1. A multiple flash lamp unit for alleviating red-eye photographic results comprising a unitary structure having definable first and second regions, at least one photoflash lamp disposed in each of said regions, first and second mounting devices forming a part of said structure and disposed in or adjacent to said first and second regions respectively, said lamp in said first region being separated from said second mounting device by said second region, said lamp in said second region being separated from said first mounting device by said first region, and coupling means for transmitting flash actuation signals from said first mounting device to the lamp in said second region and from said second mounting device to the lamp in said first region respectively.

3,937,947

DISK SWITCH LIGHT

Albert Nathanson, 75-60 199th St., Flushing, N.Y. 11366

Filed Aug. 12, 1974, Ser. No. 496,460
Int. Cl.² F21S 1/12; F21P 3/00
U.S. Cl. 240—10.1 **3 Claims**



1. In a disk switch light, the combination of a base of electrical insulation material, said base having upstanding stanchions with bearing openings, a rotatable disc switch supported in said bearing openings, a pair of stationary leaf springs secured upon said base providing electric contact means, said rotatable disk siwtch carrying a pair of lamps and a plurality of leaf contacts engagable with said contact means for illumination of said lamps, said rotatable disk switch comprising a tubular, cylindrical hub having a lamp socket in each end fitted with said lamps, a pair of axially spaced apart circular disks affixed around said hub, said leaf contacts being connected to said lamps and being wrapped around the peripheral edges of said disks so to engage said stationary leaf springs of said base, and a transparent hollow dome being fitted upon said base enclosing said rotatable disk switch and stationary leaf springs, said dome including a top wall having a pair of slots therethrough, a portion of each said circular disk protruding upwardly therethrough for manual rotation thereof, and an end of each said stationary leaf spring extending sidewardly outward from under said dome for connection to a power source.

3,937,948

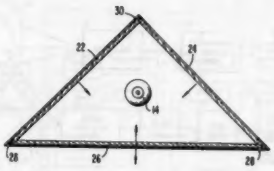
LIGHT FIXTURE

Donn Allison, Saugus, Calif., assignor to Donn Allison, Saugus, Calif.

Filed Aug. 14, 1974, Ser. No. 497,283
Int. Cl.² F21S 1/04
U.S. Cl. 240—78 R **11 Claims**

1. A light fixture comprising a housing, a light source carried by and disposed substantially centrally within said housing, said housing including a plurality of reflective surfaces disposed about said light source and comprising a first planar two-way mirror, second and third planar mirrors each includ-

ing one of said plurality of reflective surfaces, said first two-way mirror being carried by said housing along one side of said light source and said second mirror being carried by said housing along another side of said light source and disposed in a plane at an angle other than 90° with respect to the plane containing said first mirror, said third mirror being carried by said housing along another side of said light source and disposed in a plane at an angle other than 90° with respect to said first planar two-way mirror said mirrors being arranged about said light source such that at least a portion of the light rays



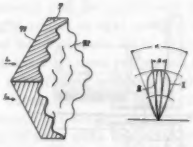
generated by said light source are reflected by the reflective surfaces of said second and third mirrors for passage through said first mirror and another portion of the light rays are reflected by the reflective surface of said first mirror interiorly of said housing for further reflection by said reflective surfaces and passage through said first mirror whereby a three-dimensional multiple light source effect comprised of a series of discrete light sources which diminish in intensity and size with depth and repetitiously fade to infinity within said housing is provided when the light source is viewed through said first mirror.

3,937,949

OPTICAL REMOTE CONTROL APPARATUS EMPLOYING LIGHT SCATTERING PLATE

Kiyotsugu Ishikawa, Takatsuki; Tetsuo Kobune, Uji; Hitoo Iwasa, Takatsuki, and Iwao Teramoto, Ibaraki, all of Japan, assignors to Matsushita Electronics Corporation, Japan

Filed May 30, 1973, Ser. No. 365,242
Claims priority, application Japan, May 30, 1972, 47-53985
Int. Cl.² H04B 9/00
U.S. Cl. 250—199 **1 Claim**



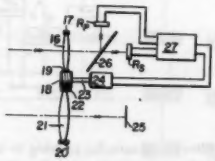
1. In an optical-remote-control apparatus including a light beam transmitter and a light-receiver disposed remote with respect to said transmitter, the improvement wherein a light-scattering plate is provided in front of said light-receiver and is arranged so as to have the entirety of its light receiving face exposed to the light beam from said transmitter irrespective of the direction from which said light beam impinges upon said light receiving face, said plate being transparent and the light receiving face thereof being substantially flat and the rear face thereof being roughened, said receiver including a photodetecting element and a focusing element disposed relative to said photodetecting element for focusing impinging light onto said photodetecting element, said focusing element comprising a reflecting focusing mirror disposed behind said photodetecting element, and wherein said light-scattering plate is disposed relative to said focusing element to scatter said impinging light thereonto, and thereby increase the angular response characteristic of said light-receiver.

3,937,950

FOCUS DEFECTING SYSTEM

Kazuya Hosoe, Tokyo; Seiichi Matsumoto, Yokohama; Hideo Yokota, and Hiroshi Aizawa, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Apr. 8, 1974, Ser. No. 459,219
Claims priority, application Japan, Apr. 11, 1973, 48-41000
Int. Cl.² G01J 1/20
U.S. Cl. 250—201 **16 Claims**



1. A detecting device for detecting the image sharpness of an object, comprising;

A. a movable image forming optical system;

B. a photoelectric transducing means positioned behind the optical system to receive an image formed by the optical system, and having;

a. a first elongated photoelectric transducing element having a semiconductor and electrodes deposited on both long sides of the semiconductor;

b. a second elongated photoelectric transducing element having a semiconductor and electrodes deposited on both short sides of the semiconductor;

C electrical circuit means coupled to the elements for generating an electrical signal in response to the intensity distribution of the light on the phototransducing means, said first transducing means and second transducing means being connected to the circuit means to produce the electrical signal combining the output of the first transducing means with the output of the second transducing means,

D. signal responding means coupled to said electrical circuit means in the path of light from the imaging forming optical system for detecting the image sharpness,

E. said first transducing means and second transducing means being positioned in the path of light from the image forming optical system to receive light from the object.

3,937,951

ALL-SKY PHOTOELECTRIC LIGHTNING DETECTOR APPARATUS

Edmund Philip Krider, Tucson, Ariz., assignor to United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 9, 1974, Ser. No. 530,643
Int. Cl.² H01J 39/12
U.S. Cl. 250—209 **4 Claims**

1. All-sky photoelectric apparatus for detecting and locating lightning discharges comprising:

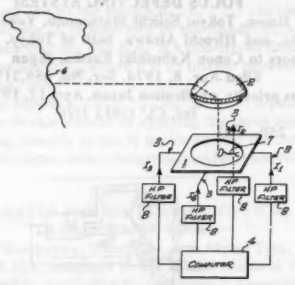
a pair of wafer-like planar detector members disposed horizontally with their vertical axes spaced apart a predetermined distance (D), said members each including means responsive to impinging optical radiations for producing XY quadrature electrical signal outputs corresponding in magnitude to the XY wafer location of the impinging radiation,

optical means for imaging substantially the entire sky on the detectors whereby a lightning discharge radiation occur-

ring at any sky location is optically imaged simultaneously at a related location on both of said detectors,

data acquisition means, and

circuit means coupling said quadrature signal outputs to said data acquisition means, said circuit means including



background-filtering means for passing to said acquisition means signal information substantially wholly representative of the optical transients of the lightning discharges,

said data acquisition means being responsive to said filtered information for providing in real time said lightning discharge location data.

3,937,952

KEYBOARD AND SWITCHES FOR KEYBOARDS

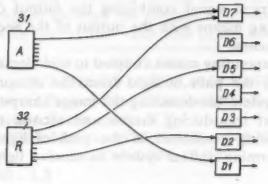
Lionel George Ripley, Lewes, and Richard Lawrence Grimsdale, Brighton, both of England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 399,618, Sept. 21, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,546

Claims priority, application United Kingdom, Sept. 22, 1972, 43965/72

Int. Cl.² G02B *5/14*

U.S. Cl. 250—227 **6 Claims**



1. A keyboard comprising:

a light source,

a plurality of optical switches,

a plurality of photodetectors,

a plurality of output light pipes for each switch selectively connecting the switch to a plurality of photodetectors,

one input light pipe for each switch being connected to the light source,

each optical switch comprising light conduction means to transmit light from the input light pipe to the plurality of output light pipes,

the amount of light from each input light pipe entering the light conduction means for transmission to the plurality of output light pipes being variable between a first level when the switch is actuated and a second level when the switch is not actuated,

each plurality of output light pipes being connected to a different combination of photodetectors which generate a signal consisting of a different multibit binary code for each switch.

3,937,953

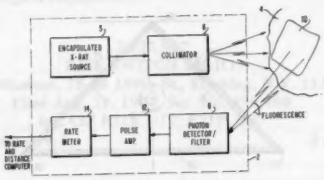
NON-CONTACTIVE PROXIMITY SENSOR SYSTEM UTILIZING NUCLEONIC RADIATION FLUORESCENCE

R. Wayne Stafford; William H. Tobey, and Benton C. Clark, III, all of Littleton, Colo., assignors to Martin Marietta Corporation, New York, N.Y.

Filed Nov. 12, 1973, Ser. No. 415,188

Int. Cl. G01n *23/20*

U.S. Cl. 250—272 **4 Claims**



1. In a terminal closure and docking alignment system for docking a monitoring vehicle with a target vehicle, radiation responsive apparatus for providing range data comrising:

a source of radiation,

means for directing said radiation to said target vehicle,

at least three targets arranged in a nonlinear configuration on said target vehicle, each of said targets being coated with a different fluorescent material for emitting a different characteristic fluorescence in response to said radiation, and

a plurality of detectors on said monitoring vehicle equal in number to the number of said targets, each of said detectors cooperating with a single one of said targets for detecting only the characteristic fluorescence of said target.

3,937,954

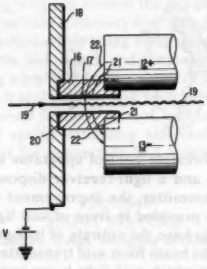
METHODS AND APPARATUS FOR SPATIAL SEPARATION OF AC AND DC ELECTRIC FIELDS, WITH APPLICATION TO FRINGE FIELDS IN QUADRUPOLE MASS FILTERS

Wade L. Fite, Pittsburgh, Pa., assignor to Extranuclear Laboratories, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 346,250, March 30, 1973, Pat. No. 3,867,632. This application Aug. 30, 1974, Ser. No. 502,158. The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.² H01J *39/34*

U.S. Cl. 250—282 **30 Claims**



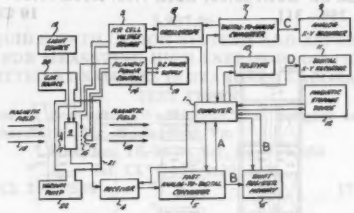
1. In a method for the spatial separation of the high frequency AC fringe fields and low frequency AC, including DC, fringe fields, near the ends of a quadrupole mass filter, the use of field separation means which includes a material which responds to the high frequency AC fields substantially as a dielectric and responds to the low frequency AC, including DC, fields substantially as a conductor of electricity.

3,937,955

FOURIER TRANSFORM ION CYCLOTRON RESONANCE SPECTROSCOPY METHOD AND APPARATUS

Melvin Barnet Comisarow, and Alan George Marshall, both of Vancouver, Canada, assignors to Nicolet Technology Corporation, Mountain View, Calif.

Filed Oct. 15, 1974, Ser. No. 514,505
Int. Cl.² H01J 39/34; B01J 59/44
U.S. Cl. 250—283 43 Claims



1. A Fourier transform ion cyclotron resonance mass spectrometer comprising:

an evacuable chamber suitable for receiving a gaseous sample to be mass analyzed;

evacuation means connected to said evacuable chamber for reducing the atmospheric pressure in said chamber to a predetermined level;

an ion cyclotron resonance cell, including a plurality of electrode plates, mounted in said evacuable chamber;

ion forming means for ionizing gases located in said ion cyclotron resonance cell;

magnetic field means for creating a unidirectional magnetic field, said magnetic field means mounted so that said unidirectional magnetic field passes through said ion cyclotron resonance cell in a predetermined direction;

voltage means connected to said plurality of plates of said ion cyclotron resonance cell, said voltage means generating voltages of a level and a polarity adequate to trap substantially all ions of a given charge sign formed by said ion forming means in said ion cyclotron resonance cell, said unidirectional magnetic field means causing said trapped ions to move orbitally at angular frequencies dependent on the mass-to-charge ratio of individual ions;

broad-band excitation means connected to said ion cyclotron resonance cell for producing a broad-band electric field at right angles to said unidirectional magnetic field, said broad-band electric field exciting all ions trapped within said ion cyclotron resonance cell that have a mass-to-charge ratio falling within a predetermined range;

broad-band detection means connected to said ion cyclotron resonance cell for simultaneously detecting the number of ions of each different mass-to-charge ratio excited by said broad-band excitation means and for generating a single time domain analog signal containing information related to the magnitude and nature of said numbers;

digitizing means connected to said broad-band detection means for digitizing said time domain analog signal related to the magnitude and nature of the number of ions of each different mass-to-charge ratio so as to produce a time domain digital signal related to the magnitude and nature of said numbers; and,

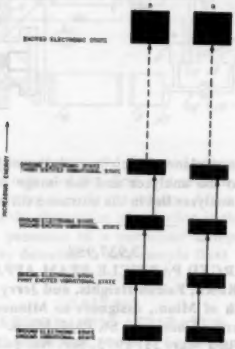
Fourier transform means connected to said digitizing means for transforming said time domain digital signal into a frequency domain signal containing information about the numerical magnitude and frequency of excited ions of each different mass-to-charge ratio trapped in said ion cyclotron resonance cell.

3,937,956

ISOTOPE SEPARATION PROCESS

Richard K. Lyon, Fanwood, N.J., assignor to Exxon Research & Engineering Company, Linden, N.J.

Filed Oct. 23, 1973, Ser. No. 408,669
Int. Cl. H01j 39/34
U.S. Cl. 250—290 11 Claims



1. A method of separating the isotopes of an element, said method being applied to a gaseous compound of said element, said method comprising subjecting the molecules of said compound to IR radiation at a predetermined frequency by means of an IR laser, said gaseous compound being irradiated by said IR laser at a power density of at least 10^4 watts per cm^2 per torr pressure of said gaseous compound for a time of between 10^{-10} and 5×10^{-5} seconds and wherein a second gas is present along with said gaseous compound, said second gas partial pressure being at least 5 times the partial pressure of said gaseous compound, whereby the molecules containing the lighter isotope or isotopes are preferentially excited and absorb more than one quanta of IR radiation, subjecting said gaseous mixture to radiation at the second predetermined frequency within the visible or ultraviolet spectrum, said second predetermined frequency being selected to convert said excited molecules to a form whereby they may be separated from the nonexcited molecules, and separating said converted molecules.

3,937,957

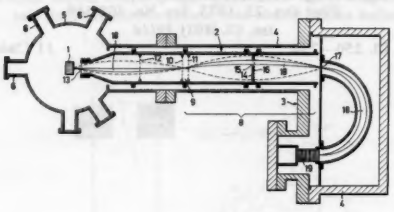
APPARATUS FOR DETERMINING THE ENERGY OF CHARGED PARTICLES

Helmut Schillalies, Rondorf, and Alfred Barz, Lohmar, both of Germany, assignors to Leybold-Heraeus-GmbH & Co., Cologne-Bayental, Germany

Filed June 18, 1974, Ser. No. 480,924
Claims priority, application Germany, June 19, 1973, 2331091
Int. Cl.² H01J 37/26
U.S. Cl. 250—305 6 Claims

1. In a device for measuring the energy of charged particles separated from a sample by bombardment with ionizing radiation, which device includes an energy analyzer and an electron-optical system disposed between the sample location and the energy analyzer and containing means defining a deceleration path for the charged particles to be analyzed, the improvement wherein said electron-optical system comprises means defining two individual lenses between which an intermediate image is formed, and grids with high transmission disposed at the boundary between each said lens and said deceleration path, and wherein said deceleration path is disposed between said lenses at the location of such intermediate

image, and said two lenses are constructed so that the image plane of the lens closer to the sample lies in the deceleration



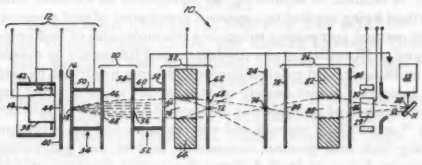
path, this image plane coincides with the object plane of the lens closer to the analyzer and the image plane of the lens closer to the analyzer lies in the entrance slit of the analyzer.

3,937,958

CHARGED PARTICLE BEAM APPARATUS

Thomas W. Rusch, Falcon Heights, and Jerry A. Sievers, Stillwater, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 31, 1975, Ser. No. 563,330
Int. Cl.² H01J *37/26*
U.S. Cl. 250—307 **31 Claims**



1. A charged particle beam apparatus comprising: (a) means for generating a charged particle beam including a source of charged particles and a primary extractor electrode having an aperture defining the effective diameter of said generated beam, (b) means for accelerating said charged particles in said beam, (c) a first focusing means for focusing said beam at a cross-over point, (d) means for limiting the diameter of said focused beam, and (e) a second focusing means for focusing said beam at a target, each of said means being located along a beam axis downstream from previously recited means, THE IMPROVEMENT WHEREIN: said accelerating means comprises

a first electrode assembly including said primary extractor electrode at the upstream end thereof and means for providing a circularly-symmetric axially-centered unipotential surface extending a first predetermined distance downstream from said extractor electrode,

a second electrode assembly the upstream end of which is spaced a second predetermined distance downstream from the downstream end of said first electrode assembly and including means for providing a circularly-symmetric axially-centered unipotential surface extending axially a third predetermined distance,

means for applying a given potential between said source of charged particles and said second electrode assembly, and

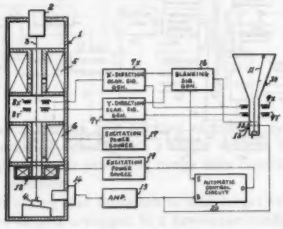
means for applying a given fraction of said given potential to said first electrode assembly in order to establish an electrostatic lens, a focal point of which is approximately in the plane of the aperture of said primary extractor electrode such that the trajectories of charged particles passing through said second electrode assembly are substantially parallel, thereby enhancing the current density of the beam at said target under a given set of focusing conditions.

3,937,959

METHOD AND APPARATUS FOR AUTOMATICALLY FOCUSING

Takao Namae, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1974, Ser. No. 536,188
Claims priority, application Japan, Dec. 24, 1973, 49-1436; Apr. 24, 1974, 49-46286
Int. Cl.² G01N *23/00;* **G21K** *7/00;* **H01K** *37/26*
U.S. Cl. 250—311 **10 Claims**



1. A method for automatically focusing the electron beam of a scanning device having an electron beam source, a condenser lens system for focusing the electron beam on the specimen, a scanning means for scanning the electron beam over the specimen, a detecting means for detecting the signal emanating from the specimen, and a display means for displaying the specimen image on a display device by using the output signal of said detecting means to modulate the scanning beam of the display device which is in synchronism with said scanning means comprising the steps for:

a. changing the condenser lens system focal length stepwise in synchromism with said scanning means,

b. converting the output of said detecting means into a signal indicative of the diameter of said electron beam,

c. comparing two converting signals indicative of the beam diameter obtained in step (b) and,

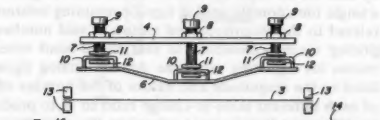
d. controlling the polarity and change width in step (a) in response to the result in step (c) to minimize the beam diameter.

3,937,960

CHARGING DEVICE FOR ELECTROPHOTOGRAPHY

Seiji Matsumoto, Asaka, and Isoji Takahashi, Tokyo, both of Japan, assignors to Rank Xerox, Ltd., London, England

Continuation of Ser. No. 227,970, Feb. 22, 1972, abandoned. This application May 3, 1974, Ser. No. 466,763
Int. Cl.² G03G *13/00*
U.S. Cl. 250—326 **4 Claims**



1. In combination

a chargable insulating surface having a directly grounded portion and another portion which is not directly grounded,

corona electrode means overlying said surface, said electrode means having a first segment overlying said directly grounded portion and a second segment overlying said portion of said surface which is not directly grounded, and

movable control plate means for varying the corona discharge generated adjacent said first segment relative to the corona discharge adjacent said second segment, whereby the flow of charge from said second segment to said indirectly grounded portion is greater than that from said first segment to said portion which is directly grounded.

3,937,961

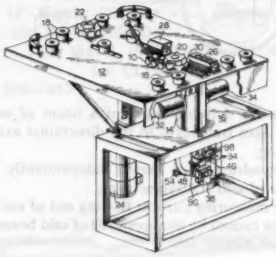
LIQUID SCINTILLATION SYSTEMS AND APPARATUS FOR MEASURING HIGH-ENERGY RADIATION EMITTED BY SAMPLES IN STANDARD LABORATORY TEST TUBES

Ronald A. Benvenutti, Woodbridge, Va., assignor to Meloy Laboratories, Inc., Springfield, Va.

Filed Jan. 18, 1974, Ser. No. 434,600

Int. Cl.² G01T *1/20, 7/08*

U.S. Cl. 250—328 **17 Claims**



1. A scintillation detection system for detecting radiation emitted by radioactive samples, said system comprising:

a sample holder including a vial containing a scintillator, means forming a well extending substantially centrally into the scintillator, the bottom end of said well being closed and the top end of said well being open, and a test tube received in said well;

a scintillation detection chamber; and

transfer means for moving said sample holder into said scintillation detection chamber for detection of scintillations emanating from said scintillator and for removing said sample holder from said chamber after said detection.

3,937,962

CORRECTION OF TWO BEAM PHOTOMETER FOR FLUID ANALYSIS

Reimar Faulhaber, and Kurt Moldenhauer, both of Frankfurt, Germany, assignors to Hartmann & Braun Aktiengesellschaft, Frankfurt, Germany

Filed Nov. 29, 1974, Ser. No. 528,420

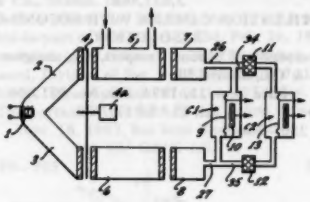
Claims priority, application Germany, Nov. 30, 1973, 2359637

Int. Cl.² G01N *21/26, 21/36*

U.S. Cl. 250—346 **8 Claims**

1. In a two beam infrared gas analyzer having a first and a second beam of radiation, the first beam traversing sample fluid in a chamber, the second beam traversing a reference fluid in a chamber, a first and second detector respectively for the first and second beams, and first means connected to the first and second detectors to derive therefrom a first signal representing the difference in detected intensities of the beams, the improvement comprising:

second means connected to the first and second detectors to derive therefrom a second signal which is the sum of the products, respectively, of two parameters α and β and of the detected intensities; and



third means connected to the first and second means for forming the ratios of the first and second signals, said ratio representing directly the relation $A/(\alpha+\beta(1-A)$, wherein A is the absorption of radiation in the first chamber due to presence of a particular component to be quantitatively detected in said sample fluid.

3,937,963

RADIOGRAPHIC APPARATUS

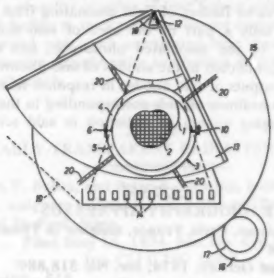
Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Filed June 4, 1974, Ser. No. 476,300

Claims priority, application United Kingdom, June 5, 1973, 26811; Feb. 14, 1974, 6809/74

Int. Cl.² G01T *1/20;* G02B *5/00;* G21K *5/08, 5/06*

U.S. Cl. 250—363 **9 Claims**



1. Apparatus for examining the body of a patient by means of penetrating radiation comprising:

a. a ring-shaped locating structure adapted to enclose the part of the patient to be examined,

b. a source of penetrating radiation,

c. a detecting means sensitive to the radiation,

d. a scanning structure, which is rotatable about an axis passing through the part of the patient enclosed by said locating structure, supporting said source and said detecting means so that the source can project radiation through the said part of the patient to be received by the detecting means,

e. means for rotating said scanning structure about said axis so that the radiation can be projected through the body from a plurality of different directions in a plane substantially perpendicular to the said axis and,

f. an attenuating mass not attached to and adapted to rotate around said locating structure on rotation of said scanning structure so as to present substantially the same profile to the radiation in the different positions of the scanning structure to compensate for changes in the absorbing path length presented to the X-rays by the body

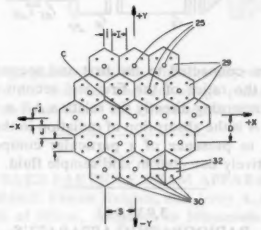
and locating structure during the scanning movement, wherein the locating structure is located in a fixed position during motion of the scanning structure.

3,937,964

SCINTILLATION CAMERA WITH SECOND ORDER RESOLUTION

Gerd Muehllehner, Mount Prospect, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Filed June 21, 1974, Ser. No. 481,694
Int. Cl.² G01T 1/20
U.S. Cl. 250—366 7 Claims



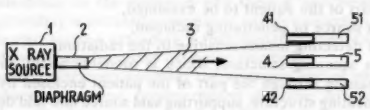
1. A radiation imaging device comprising scintillation means producing flashes of light therein at the locations of impinging quanta or radiation, a plurality of phototubes each positioned for viewing a particular area of said scintillation means and each comprising a plurality of anodes for generating discrete electrical output signals, each anode being particularly responsive to flashes of light emanating from a sector encompassing only a part of the area of said scintillation means viewed by the associated phototube, and electrical circuit means connected to the anodes of said phototubes and resolving the outputs of said anodes in response to each flash of light into co-ordinate signals corresponding to the co-ordinates of impinging quanta of radiation in said scintillation means.

3,937,965

RADIOGRAPHY APPARATUS

Jean Pierre Vasseur, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 29, 1974, Ser. No. 518,889
Claims priority, application France, Oct. 30, 1973, 73.38641
Int. Cl.² G01T 1/20; G02B 5/00; G21K 1/02
U.S. Cl. 250—366 8 Claims



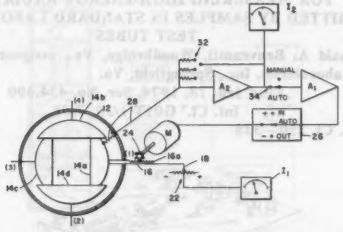
1. A radiography apparatus comprising an X-ray source, a collimator system for concentrating the emitted rays in a flat beam, and principal receptors connected to said source and arranged in the plane in order each to receive a predetermined portion of the beam, the set of principal receptors receiving substantially the whole of the beam, and associated with each principal receptor at least one auxiliary receptor, means for shielding said auxiliary receptor from the direct rays emitted by the source so that it only receives the radiation portions emitted as a consequence of the Compton effect, electrical circuits being provided in order to effect a linear combination of the amplitudes of the signals received respectively by the receptor and the auxiliary receptor.

3,937,966

ACCELERATOR BEAM PROFILE ANALYZER

Julius B. Godel, Bayport, N.Y.; Marcel Guillaume, Grivegnee, Belgium; Richard M. Lambrecht, East Quogue, and Ronald Withnell, East Setauket, both of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 19, 1975, Ser. No. 551,200
Int. Cl.² G01T 1/16
U.S. Cl. 250—393 5 Claims



1. Apparatus for defining edges of a beam of subatomic particles along axes transverse to the directional axis of said beam comprising:

a. multiple quadrant plate means independently movable along each of said transverse axes;

b. means for measuring current flowing out of each of said plate means caused by impingement of said beam on each of said plate means; and

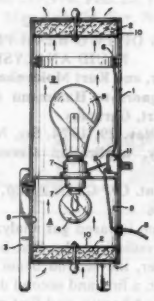
c. means for moving each of said plate means along each said transverse axis until current flow reaches predetermined values indicating a predetermined point on the outer edges of said beam along said transverse axes thereby defining the extent of said beam along said transverse axes.

3,937,967

ELECTRONIC AIR PURIFIER WITH OZONE SUPPRESSION

Kurt Steinitz, 7 Kingswood Road, Danbury, Conn. 06810

Filed Apr. 16, 1974, Ser. No. 461,409
Int. Cl.² G01N 21/24
U.S. Cl. 250—435 4 Claims



1. An apparatus for purifying and sterilizing the air in a space and for decomposing ozone within said air comprising:

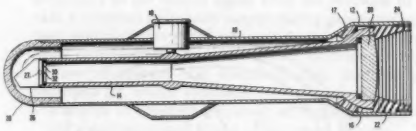
a tubular housing having top and bottom sections with a horizontal cross section smaller than its vertical cross section and comprising a flow path for air and air-ozone mixtures; an air inlet in said bottom section and air outlet in said top section; an ultra violet radiating device placed in said bottom section of said housing in proximity to said air inlet for creating within said bottom section ozone in air of ambient temperature, and for emitting germicidal radiation; a heating device placed in said top section of said housing above said ultra violet radiating device for heating and decomposing ozone in said air-ozone mixture, and for supporting air flow through said tubular housing; means for connecting said ultra violet radiating device and said air heating device to an electric power supply; means for regulating the temperature of said heating device and of said air-ozone mixture in said top section of said housing; the air flow path in said housing comprising in the bottom section a germicidal radiation and ozone forming region and in the top section an ozone decomposing, impurities oxidizing and molecular oxygen forming region.

3,937,968

OPTICAL AIMING DEVICE EMPLOYING RADIOLUMINOUS MATERIAL

Samuel G. Harris, Vienna, Va., assignor to Singlepoint U.S.A. Inc., Washington, D.C.

Filed May 2, 1969, Ser. No. 821,177
Int. Cl.² F21K 2/00
U.S. Cl. 250—467 **4 Claims**



1. An aiming device for guns, optical instruments and the like comprising:

a. an elongated housing for mounting on a gun or optical instrument with the longitudinal axis of said housing substantially parallel to the longitudinal axis of the device to be aimed;

b. a light collimator adjacent one end of said housing and having its optical axis substantially aligned with the longitudinal axis of said housing;

c. a spot source of light of a first color supported adjacent the opposite end of said housing and positioned on the optical axis of said collimator;

d. a thin opaque plate having an aperture therein smaller than said spot source, positioned adjacent said source and between said source and said collimator with said aperture on the optical axis of said collimator; and

e. a light gathering filter surrounding said spot light source, said filter having a color different from said first color, said filter being exposed to the ambient light surrounding said housing;

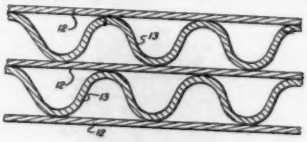
whereby under conditions of high ambient lighting intensity said spot source of light will appear to the user as a spot of the color of said filter and as ambient lighting intensity decreases toward zero, said spot source of light will appear to the user as a spot of said first color.

3,937,969

GAMMA RAY CAMERA SYSTEM WITH CORRUGATED COLLIMATORS

Gerd Muehllehner, Mount Prospect, Ill., assignor to G. D. Searle & Co., Skokie, Ill.

Continuation of Ser. No. 357,917, May 7, 1973, and a continuation-in-part of Ser. No. 332,934, Feb. 16, 1973, and a continuation-in-part of Ser. No. 260,188, June 6, 1972, abandoned, Division of Ser. No. 52,924, July 7, 1970, abandoned. This application Nov. 14, 1974, Ser. No. 523,690. The portion of the term of this patent subsequent to Nov. 18, 1992, has been disclaimed.
Int. Cl.² G21K 1/02
U.S. Cl. 250—505 **6 Claims**



1. A gamma ray camera system for imaging an in vivo distribution of a radioactive material which emits gamma rays comprising:

a gamma ray detector, including a transducer sensitive to gamma rays, of the type producing output signals delineating spatial coordinates of interaction of gamma rays with said transducer; and

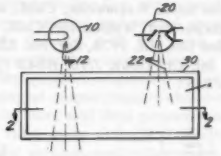
a gamma ray collimator adapted to be mounted adjacent said transducer comprising a plurality of straight strips of lead foil no greater than about 0.01 inches in thickness and a plurality of strips of lead foil no greater than about 0.01 inches in thickness and having corrugations therein arranged with each corrugated strip mounted between successive straight strips to produce an array of collimating channels.

3,937,970

OPTICALLY-TRANSPARENT RADIATION-SHIELDING COMPOSITION

Theodore F. Bolles, and Peter B. Fleming, both of Woodbury, Minn., assignors to Theodore F. Bolles and Peter B. Fleming, both of St. Paul, Minn.

Filed May 16, 1974, Ser. No. 470,351
Int. Cl.² G21C 11/00
U.S. Cl. 250—515 **10 Claims**



1. A high energy radiation shield consisting essentially of

A. an optically transparent container means and, filling said container means,

B. highly viscous substantially optically transparent, colorless and clear liquid composition in metastable glassy state consisting essentially of

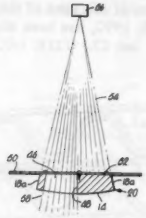
a. at least one lead salt of a first organic acid of from one to five carbon atoms and

b. at least one chloride, bromide, nitrate or different salt of organic acid of one to five carbon atoms, of at least one metal of the group consisting of lead, thallium and mercury.

3,937,971
METHOD AND APPARATUS FOR MAKING A FOCUSED SHIELD

Richard A. Morrison, 9021 Delmar, Prairie Village, Kans. 66207, and Cecil W. Johnston, 19710 Lake City Road, Independence, Mo. 64057

Filed Oct. 11, 1974, Ser. No. 514,109
Int. Cl.² G21C *11/00;* **H01J** *35/16*
U.S. Cl. 250—515 **17 Claims**



1. A method of making a focused shield for use in connection with a radiation therapy machine or the like, said method comprising the steps of:

forming a shield blank having a planar top side and an opposite, rounded bottom side;

forming a shield blank holding fixture having a rounded shield blank supporting surface provided with a radius of curvature complementary to the curvature of the bottom side of said shield blank;

selectively placing on the top side of said shield blank an outline having a configuration corresponding to a predetermined area of a patient to be exposed to a field of radiation;

placing said fixture on a cutting table of a band saw or the like;

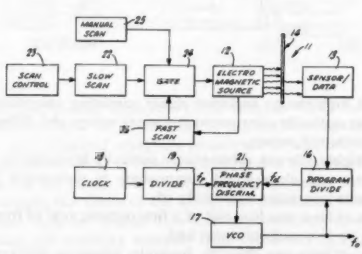
positioning said shield blank on said fixture with the rounded bottom side of said shield blank resting on said rounded surface of said fixture; and

cutting said shield blank along said outline with said saw or the like while maintaining the shield blank in contact with said rounded surface to provide a focused shield having a bevel-walled aperture corresponding to said predetermined area.

3,937,972
ELECTROMAGNETICALLY ENERGIZED SCANNING FREQUENCY SYNTHESIZER

Stephen Charles Snell, Watsonville, Calif., assignor to Linear Systems Incorporated, Watsonville, Calif.

Filed Dec. 26, 1974, Ser. No. 536,488
Int. Cl.² G06K *7/10;* **H04B** *1/06*
U.S. Cl. 250—555 **14 Claims**

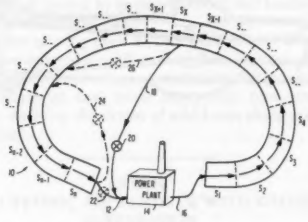


1. A frequency synthesizer comprising means for radiating electromagnetic energy, an array of electromagnetic energy transducers spaced from said means for radiating for producing a plurality of discrete electrical output signals responsive to impingement of electromagnetic energy thereon, removable means for positioning between said means for radiating and said array having a predetermined pattern thereon for blocking said electromagnetic energy from predetermined transducers in said array, thereby providing a predetermined combination of said discrete electrical output signals, a voltage controlled oscillator for providing an output signal at a controlled output frequency, a programmable divider having a plurality of input terminals each connected to one of said discrete electrical output signals, said programmable divider connected to receive said controlled output frequency and producing an output signal having a divider output frequency determined by said predetermined combination of said discrete electrical output signals, means for providing a reference frequency, means for comparing said divider output frequency with said reference frequency producing a control signal related to the difference therebetween, said control signal being connected to said voltage controlled oscillator for driving said controlled output frequency to a predetermined value.

3,937,973
METHOD FOR DETERMINING AND CONTROLLING LIQUID COOLING SYSTEM CHARACTERISTICS

Charles W. Weber; C. Olen Rucker; Patrick L. Peavy; Pak-Fat William Woo, and James E. Bear, all of Houston, Tex., assignors to Brown & Root, Inc., Houston, Tex.

Division of Ser. No. 247,703, April 26, 1972, Pat. No. 3,847,207. This application July 30, 1974, Ser. No. 493,662
Int. Cl.² B60L *1/02;* **F01K** *17/02*
U.S. Cl. 290—2 **11 Claims**



1. A method for operating a liquid cooling system including a cooling reservoir having a surface exposed to the atmosphere along at least a portion of a flow path of a reservoir, the method comprising the steps of:

establishing a plurality of reservoir segments each representing specified time intervals and together representing at least a portion of an overall flow pattern of the cooling system, the flow path of the reservoir including an electric power generating plant condenser;

determining an initial thermal characteristic of at least one of the segments at a first time and at a predetermined location in the cooling system;

at least periodically determining the thermal characteristic of the one segment at successive specified time intervals after said first time in response to the initially determined thermal characteristic and prevailing heat transfer conditions to which the segments are exposed, the prevailing heat transfer conditions including the hourly generated electric power of the electric power generating plant; and,

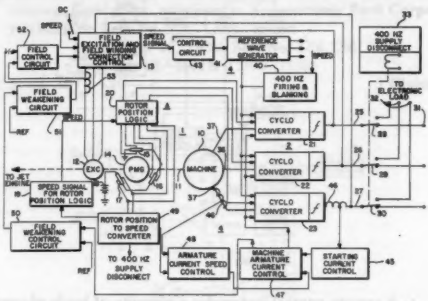
modifying the flow pattern of the cooling system responsively to the determined thermal characteristics of the at least one segment.

3,937,974

STARTER-GENERATOR UTILIZING PHASE CONTROLLED RECTIFIERS TO DRIVE A DYNAMOELECTRIC MACHINE AS A BRUSHLESS DC MOTOR IN THE STARTING MODE WITH STARTER POSITION SENSE VARIATION WITH SPEED

David Logan Lafuze, Erie, Pa., assignor to General Electric Company, Wilmington, Mass.

Filed Aug. 30, 1974, Ser. No. 502,027
Int. Cl.² F02N 11/04; H02K 23/52; H02P 9/04
U.S. Cl. 290—46 4 Claims



1. In a starter-generator system, the combination of:

a. a dynamoelectric machine for operation both as a brushless DC motor and as a constant frequency AC generator,

b. cycloconverter means coupled to said machine for selectively supplying current to the machine armature windings during motoring operation and for converting the frequency of the output signal from the machine to provide a constant frequency output during generator operation, said cycloconverter means including banks of oppositely poled, phase controlled, gated, switching devices.

c. means to operate said dynamoelectric machine as a brushless DC motor including,

1. a source of constant frequency alternating supply voltage coupled to said banks of switching devices,

2. means for sensing the rotor position of said dynamoelectric machine and for producing in response thereto enabling signals to gate selected ones of said switching devices in sequence to permit current flow in selected armature windings as a function of rotor position so that current flows in the armature winding having flux associated therewith to produce positive torque,

3. means for controlling the phase angle between armature current, flux, and machine voltage over a predetermined speed range only to provide a fixed phase angle over a speed range wherein the machine voltage frequency does not exceed one-half of the supply voltage and to vary the phase angle at speeds wherein the machine voltage frequency exceeds one-half the supply voltage frequency, including means responsive to the speed of the machine for shifting the phase of the enabling signals to vary the angle at which the switching devices are gated over the speed range wherein the machine voltage frequency exceeds one-half of the supply voltage frequency, to permit commutation of the switching devices by the machine voltage whereby the said gating angle is maintained at a fixed minimum value at speeds up to said range thereby maximizing torque, and is increased with speed over said speed range,

d. a source of constant frequency reference waves,

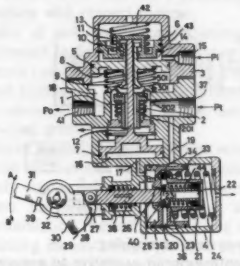
e. means for converting the system from the motoring to the generating mode including means responsive to the speed of the dymamoelectric machine for disconnecting the constant frequency supply voltage, and for disconnecting the rotor position sensing and enabling signal producing means from said bank of switching devices when the machine reaches a predetermined speed at which the machine is to operate as a generator, and means for coupling the source of constant reference frequency waves to said banks of said switching devices for said cycloconverter means when the machine reaches said predetermined speed.

3,937,975

COMBINED LOAD SENSING PRESSURE PROPORTIONING RELAY VALVE

Itiro Yanagawa, and Isao Suzuki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co. Ltd., Japan

Filed Nov. 15, 1974, Ser. No. 524,136
Claims priority, application Japan, Dec. 6, 1973, 48-136652
Int. Cl.² B60T 8/18
U.S. Cl. 303—22 R 4 Claims



1. A combined load-sensing and pressure-proportioning relay valve, for a vehicle air brake system, comprising, in combination, a relay valve unit including a relay valve body formed with a first inlet port for connection to a source of indicated pressure for controlling brake application, a second inlet port for connection to a source of brake supply pressure, an outlet port for connection to the air brake actuators, and an exhaust port, a main valve disc in said relay valve body controlling communication between said second inlet port and said outlet port and having an axial exhaust bore communicating with said exhaust port, means in said relay valve body biasing said main valve disc to a closed position blocking communication between said second inlet port and said outlet port and said exhaust bore, and a control piston assembly in said relay valve body operable to adjustably displace said main valve disc to an open position; and a modulated-pressure control valve unit communicating with said relay valve unit and supplying, to said control piston assembly, a pressure modulated according to the loading of the vehicle; said control piston assembly including first, second and third pressure-responsive pistons; said first and second pressure-responsive pistons conjointly defining, with said relay valve body, an indicated pressure chamber communicating with said first inlet port; said first pressure-responsive piston and said relay valve body defining an output pressure chamber communicating with said outlet port; said third pressure-responsive piston and said relay valve body defining a modulated-pressure chamber; said first pressure-responsive piston being engageable with said main valve disc, responsive to the indicated pressure, to close said axial exhaust bore and to displace said main valve disc to an open position connecting said inlet port to said output pressure chamber; means biasing said first pressure-responsive piston to a position disengaged from said main valve disc; a loading spring biasing said second pressure-responsive piston toward aid first pressure-responsive piston in opposition to the indicated pressure; said modulated-pressure control valve unit communicating with said second inlet port and said modulated-pressure chamber; means biasing said modulated-pressure control valve unit to a closed position blocking communication between said second inlet port and said modulated-pressure chamber; a stroke adjuster operatively associated with said modulated-pressure control valve

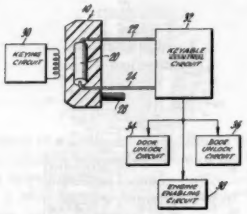
unit and operable, responsive to vehicle loading, to open said modulated-pressure control valve unit; and a normally closed valve in said modulated-pressure control valve unit opened, responsive to the modulated pressure exceeding the brake supply pressure upon a decrease in the brake supply pressure, to equalize the modulated pressure and the brake supply pressure.

3,937,976

DISGUISED COIL FOR SECURITY SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Francis A. McGuirk, Jr., Chatham, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Sept. 20, 1974, Ser. No. 508,292
Int. Cl.² H02G 3/00
U.S. Cl. 307—10 AT **5 Claims**



1. A security system comprising:

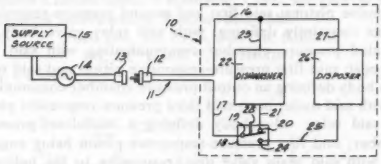
A keyable control circuit operative to generate a signal to actuate at least a door unlock circuit; a sensing element connected to said keyable control circuit for coupling a key circuit to said keyable control circuit; a molded epoxy resin casting having a plurality of surfaces encapsulating said sensing element; at least one predetermined symbol molded into a first surface to disguise said sensing element; mounting means molded into and extending from a second surface of said epoxy resin casting; and electrical connections from said sensing element molded into and extending from the same second surface of said epoxy resin casting.

3,937,977

COMBINATION DISPOSER RUN AND DISHWASHER DISCONNECT SWITCH FOR KITCHEN MODULE

Keith Ellis Carr, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Aug. 26, 1974, Ser. No. 500,599
Int. Cl.² H02J 4/00
U.S. Cl. 307—38 **1 Claim**



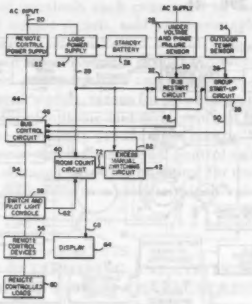
1. A modular kitchen unit comprising a dishwasher, a sink, and a batch-feed garbage disposer in said sink, in combination with, a supply circuit having a single overload protection means remote from said unit, and comprising: an electrical switch in said disposer, means electrically connecting said switch to said single overload protection means and to circuitry for operating said unit, said switch having a first, normally closed contact means therein to supply electrical energy to said dishwasher and having a second, normally open contact means therein to supply electrical energy upon actuation of said switch to said disposer, said actuation interrupting said supply of energy to said dishwasher and connecting power to said disposer so that said single overload protection means is used and only one appliance is connected to the power source at one time.

3,937,978

REMOTE CONTROL SYSTEMS FOR ELECTRICALLY OPERATED LOADS

Carl L. Owenby, Jr., 219 W. King St., Quincy, Fla. 32351

Filed May 30, 1975, Ser. No. 582,150
Int. Cl.² H02J 3/14
U.S. Cl. 307—41 **18 Claims**



1. A remote control system for a plurality of loads adapted to be operated by electrical power supplied on a plurality of buses comprising:

switching means for controlling the electrical power supplied to the loads;

electrical sensing means for providing a signal corresponding to variations of the electrical power from a prescribed value;

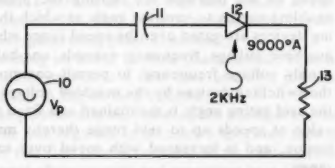
restarting means receiving said signal from said electrical sensing means and including timing means for producing a timing signal representative of the time said signal from said electrical sensing means exists, a plurality of output means coupled with said switching means and responsive to said signal from said electrical sensing means for interrupting power supplied to the loads, and sequencing means responsive to said timing means to sequentially operate said output means with the time between the operation of successive output means dependent upon the time said signal from said electrical sensing means exists whereby power is returned to the loads sequentially.

3,937,979

PHOTOPARAMETRIC AMPLIFYING UPCONVERTER

Michael K. Giles, and Walter E. Freitag, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 7, 1973, Ser. No. 422,810
Int. Cl.² H03F 7/04
U.S. Cl. 307—88.3 **3 Claims**



1. A low frequency photoparametric amplifying upconverter comprising:

pump means for providing a pumping voltage of a frequency of approximately one megahertz;

an output load;

photodiode means operatively connected in series with said pump means and said load means;

clamping means comprising an isolating capacitor also

connected in series with said pump means and said photodiode means for clamping the photodiode means in a reverse bias condition and for blocking the input signal;

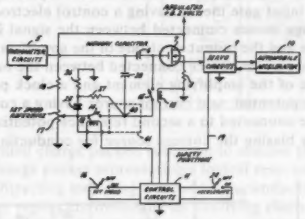
said photodiode being pumped so that it operates as a photoparametric amplifying upconverter;

the input signal for the photoparametric amplifying upconverter comprising the junction current generated by illuminating the photodiode means.

3,937,980
PRINTED WIRING CIRCUIT GUARD RING

Helmut G. Seidler, Schwenksville, and James T. Walker, Norristown, both of Pa., assignors to Aeronutronic Ford Corporation, Blue Bell, Pa.

Filed Sept. 16, 1974, Ser. No. 506,256
Int. Cl.² H01H 35/00, 35/06
U.S. Cl. 307—120 3 Claims

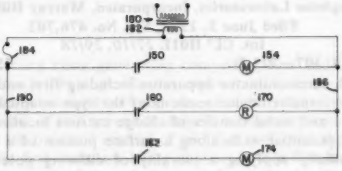


1. A printed wiring circuit board intended for automotive speed control circuit applications; said circuit including a low leakage memory capacitor connected to provide a speed reference function; a first electrical relay connected to establish a controlled charge on said capacitor; a controlled accelerate component group including a large value resistor, a second electrical relay, and a capacitor having a value large compared with said memory capacitor; said group connected to provide for a slowly changing increment of charge on said memory capacitor in response to the controlled actuation of said relays, and having a common point of connection on said printed wiring board; said circuit board comprising: an insulating substrate having metallic conductors arrayed thereon to establish the wiring pattern necessary to interconnect the components of said circuit, and a conductive ring immediately surrounding said common point of connection, said ring being connected to a source of potential approximating the normal operating potential of said common point.

3,937,981
WASH PROGRAM SELECTION AND INDEXING APPARATUS

Marcus I. Nystuen, St. Paul, and Roger L. Dillon, Cottage Grove, both of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Mar. 22, 1974, Ser. No. 453,716
Int. Cl.² H01H 43/00, 47/00
U.S. Cl. 307—141 28 Claims



16. In fabric washing apparatus having a program band having a continuous program surface encoded with a plurality of program triggering elements occupying zones of varying extent about the program surface each of the program triggering elements being associated with at least one laundering function, and control means operatively connected to survey the continuous program surface and being responsive, when activated, to the encoded program triggering elements to cause said washing apparatus to sequentially perform selected ones of the laundering functions in time dependent manner as the program band is advanced, the improvement comprising:

a. a continuous indexing band connected to said program band to advance therewith, said indexing band being divided into a plurality of laterally spaced tracks extending longitudinally about said band, each of said tracks being characterized by indexing elements thereon marking the start and end of a different laundry program defined by the program triggering elements representing laundry functions encoded within one of the zones on said program band whose longitudinal extent corresponds to the spacing of said indexing elements within that associated track and has a predetermined longitudinal position with respect thereto;

b. a plurality of individual sensing means each operatively mounted in fixed position relative a different one of said tracks and disposed to survey a small area of its associated said track, for sensing when energized said indexing elements of its associated said track within said surveyed area thereof;

c. a plurality of manually operated input selector switching means, one each of said selector switching means being operatively connected with a different one of said sensing means, for selectively energizing in response to manual stimulation thereof said sensing means, each of said switching means being operative upon stimulation thereof to energize a different one of said sensing means;

d. motor means, responsive to energization of any one of said sensing means, for moving said indexing band relative said sensing means;

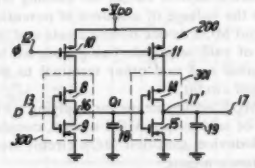
e. means, responsive to each of said sensing means for activating the control means upon the sensing of one of said indexing elements by any one of said energized sensing means; and

f. timer means, responsive to each of said energized sensing means upon the sensing thereof of their respective said indexing elements for moving said program band relative said control means in time dependent fashion to sequentially execute the laundering functions of the selected said laundry program.

3,937,982
GATE CIRCUIT

Toshio Nakajima, Tokyo, Japan, assignor to Nippon Electric Co., Inc., Tokyo, Japan

Filed Mar. 18, 1974, Ser. No. 452,425
Claims priority, application Japan, Mar. 20, 1973, 48-32892
Int. Cl.² H03K 19/08, 19/34, 19/36, 3/353
U.S. Cl. 307—205 10 Claims



1. A gate circuit including

a power source having first and second terminals;

a logic circuit including at least one complementary pair of insulated gate field effect transistors, said logic circuit having at least one input terminal, an output terminal, a first biasing terminal and a second biasing terminal, said first biasing terminal of said logic circuit being directly and continuously connected to said first terminal of said power source;

means for applying an input signal to said input terminal of said logic circuit;

first switching means connected between said second terminal of said power source and said second biasing terminal of said logic circuit;

a first inverter circuit including a complementary pair of insulated gate field effect transistors, said first inverter circuit having an input terminal, an output terminal, a first biasing terminal and a second biasing terminal, said input terminal of said inverter circuit being connected to said output terminal of said logic circuit and said first biasing terminal of said inverter circuit being directly and continuously connected to said first terminal of said power source;

second switching means connected between said second terminal of said power source and said second biasing terminal of said inverter circuit; and

means for applying a common control signal to both said first and said second switching means, said common control signal including at least a first and second sequential pulses, and wherein an output signal is generated at said output terminal of said inverter circuit in response to said input signal which is applied to said input terminal of said logic circuit while said first pulse is being applied to said first and second switching means and said output signal is stored at said output terminal of said inverter circuit until said second pulse is applied to said first and second switching means.

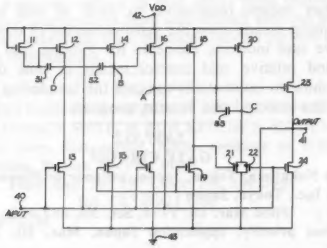
3,937,983
MOS BUFFER CIRCUIT

John A. Reed, Los Altos, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 380,348, July 18, 1973, abandoned. This application Apr. 3, 1975, Ser. No. 564,855

Int. Cl.² H03K *19/08, 19/40, 17/10*

U.S. Cl. 307—205 **9 Claims**



2. An MOS control circuit for causing an output signal to approach the voltage of a source of potential comprising:

an output MOS device having a gate and two terminals, said one of said terminals being coupled to said source of potential and said other terminal to the output of said control circuit;

a first MOS circuit means for applying a first voltage to said gate of said output MOS device, coupled to said output MOS device, said first MOS circuit means including capacitance means;

a second MOS circuit for applying a second voltage to said gate of said output MOS device, coupled to said output MOS device, said second voltage having a magnitude greater than said source of potential;

feedback means, for feeding back said output signal such as to cause said second voltage to be applied to said gate of said output MOS device and to electrically decouple said capacitance means of said first MOS circuit from said gate;

whereby said output MOS device is first driven by said first voltage, then by said second voltage.

3,937,984
SHIFT REGISTERS

Peter William Fry, Dorchester, England, assignor to Integrated Photomatrix Limited, Dorchester, England

Filed Oct. 7, 1974, Ser. No. 512,490

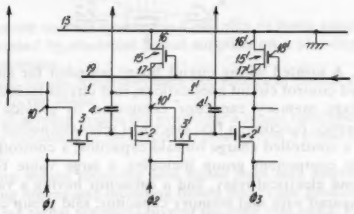
Claims priority, application United Kingdom, July 25, 1974, 32981/74

Int. Cl.² G11C *19/28, 19/18;* **H03K** *1/17*

U.S. Cl. 307—221 C **6 Claims**

6. A shift register circuit comprising:

a plurality of stages, each stage including an input node for receiving pulses to be shifted through the stage; a single amplifying element having a non-inverting signal input electrode, a current input electrode and an output electrode which constitutes the output of the stage; an inpu gate means which is connected between the input node and the signal input electrode of the amplifying element, said input gate means having a control electrode; charge storage means connected between the signal input electrode and the output electrode of the amplifying element; and a current source connected between the output electrode of the amplifying element and a clock pulse reference potential, said current source having a control electrode connected to a second reference potential continuously biasing the current source for conduction;



means connecting the output electrode of at least selected of said stages to the respective input node of the next succeeding stage in the shift register circuit,

the said control electrode of a said input gate means for a given stage being connected to receive a first series of clock pulses, and said current input electrode of said amplifying element of the same given stage being connected to receive a second series of clock pulses in non-overlapping relation with the pulses of the first series,

and wherein a next succeeding stage following said given stage has the control electrode of its input gate means connected to receive the second series of clock pulses, and the current input electrode of its amplifying element connected to receive said first series of clock pulses.

3,937,985
APPARATUS AND METHOD FOR REGENERATING CHARGE

James Albert Cooper, Jr., Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 5, 1974, Ser. No. 476,702

Int. Cl.² H01L *27/10, 29/78*

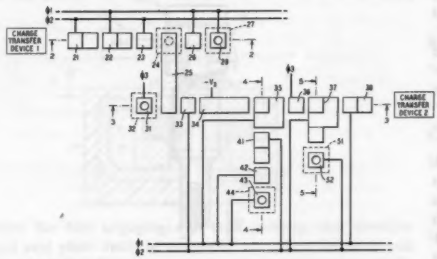
U.S. Cl. 307—221 D **25 Claims**

1. A semiconductor apparatus including first and second charge transfer device sections of the type adapted for the storage and serial transfer of charge carriers localized in induced potential wells along a surface portion of a body by sequentially applying a plurality of differing potentials to successive portions of the surface and further adapted for logical bit regeneration, said apparatus comprising:

means for detecting a charge packet output of the first charge transfer device section and for multiplying said charge packet by a multiplication factor so that after multiplication the difference in the amount of charge in a charge packet representing a logical 1 and in a charge packet representing a logical 0 is at least as great as the maximum charge storage capacity of a potential well of

the second charge transfer device section, said means for multiplying including a semiconductor charge storage region controlled by an overlying electrode of such geometry as to produce a sufficient storage capacitance that the region in response to said output stores a charge packet which is amplified compared with the storage packet output;

means for subtracting a fixed quantity of charge from the



multiplied charge packet, sufficient to remove the charge of a charge packet representing a logical zero, said means for subtracting including a second semiconductor charge storage region controlled by an overlying electrode; and

means including a localized impurity zone charge sink for limiting the amount of charge in the charge packet to a maximum value equal to the minimum charge storage capacity of a potential well of the second charge transfer device section.

3,937,986

LINEAR WAVEFORM GENERATOR

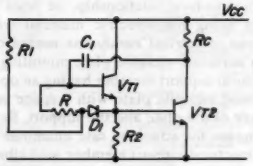
Arnold Wilson, Hertford, England, assignor to Rank Xerox Ltd., London, England

Filed Mar. 11, 1974, Ser. No. 450,270

Claims priority, application United Kingdom, Mar. 23, 1973, 14211/73

Int. Cl.² H03K *4/08*

U.S. Cl. 307—228 **2 Claims**



1. A timing ramp generating comprising first and second transistors each having collector, emitter and base electrodes, a capacitor connected between base of said first transistor and the collector of said second transistor, a resistance connected between the base and emitter of said first transistor, the emitter of said first transistor being connected to a first terminal and the base of said second transistor, a resistive load coupled intermediate the collector of said second transistor, and a second terminal, said second terminal connected to the collector of said first transistor, source of d.c. voltage connected across said first and second terminals, whereby a constant current charges the capacitor and a linear timing ramp is generated at the collector of said second transistor which approaches the applied d.c. voltage.

3,937,987

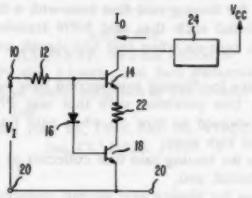
THRESHOLD DETECTOR

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 11, 1974, Ser. No. 459,954

Int. Cl.² H03K *5/20, 17/60*

U.S. Cl. 307—235 W **9 Claims**



1. A threshold switch comprising:

input, output and common terminals;

first and second transistors, each having a base and an emitter and a collector electrode, said first transistor collector electrode being connected to said output terminal and said second transistor emitter electrode being connected to said common terminal;

a first resistive element connected between said first transistor emitter electrode and said second transistor collector electrode;

a second resistive element connected between said input terminal and said first transistor base electrode;

means with first and second terminals for providing a substantially fixed offset potential responsive to current flow having a range of values between its first and second terminals;

negligible direct current impedance means connecting said first terminal to said base electrode of said first transistor; and

negligible direct current impedance means connecting said second terminal to the base electrode of said second transistor.

3,937,988

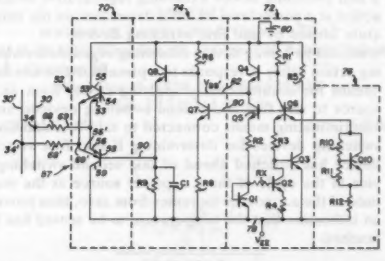
ACTIVE TERMINATION NETWORK FOR CLAMPING A LINE SIGNAL

Larry W. DeClue, San Jose, and Harold H. Muller, Mountain View, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Apr. 5, 1974, Ser. No. 458,151

Int. Cl.² H03K *5/08*

U.S. Cl. 307—237 **9 Claims**



1. An active termination network for clamping line signals near the receiving portions of a plurality of data paths, said line signals each having a high state and a low state and being susceptible to noise, which causes said line signals to undesirably fluctuate above said high state and below said low state, said network comprising:

NPN transistor means including a first plurality of emitter means, a first base and a first collector;

PNP transistor means including a second plurality of emitter means, a second base and a second collector, each of said first plurality of emitter means being coupled to corresponding ones of said second plurality of emitter means to form a plurality of input terminal means for said termination network, said plurality of input terminal means being disposed for connection to said plurality of data paths near said receiving portion;

first means for biasing said first base with a first reference bias potential such that said NPN transistor means is caused to turn on when said line signals are below said low state;

second means for biasing said second base with a second reference bias potential such that said PNP transistor means is caused to turn on when said line signals are above said high state;

third means for biasing said first collector at a third reference potential; and,

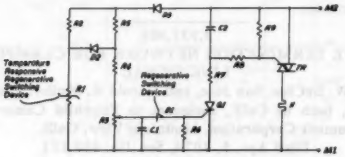
fourth means for biasing said second collector at a fourth reference potential that is relatively negative with respect to said third reference potential, such that when said line signal fluctuates above said high state said PNP transistor means turns on so as to clamp each of said line signals to said high state, and when said line signals fluctuate below said low state said NPN transistor means turns on so as to clamp each of said line signals to said low state, wherein said first and second means for biasing include means responsive to said third and said fourth reference potentials and operative to provide said first and said second reference bias potentials which are voltage compensated with respect to said third reference potential such that each of said input terminal means is voltage and temperature compensated.

3,937,989

TEMPERATURE DISCRIMINATION APPARATUS

Robert S. Meijer, Montreal, Canada, assignor to Multi-State Devices Ltd., Dorval, Canada

Filed Dec. 6, 1974, Ser. No. 530,390
Int. Cl.² H03K 17/72
U.S. Cl. 307—252 B **7 Claims**



1. A temperature discrimination apparatus comprising:

a. a first switching device exhibiting regenerative switching action at a power level which is dependent on the temperature sensed by said first switching device;

b. a second switching device exhibiting regenerative switching action solely in response to a preselected power level;

c. means for simultaneously applying power from an a.c. source to said first and second switching devices; and

d. discriminating means connected to said first and second switching devices for determining if said first switching device has switched ahead of said second switching device in the cycle of the a.c. power source as the magnitude of the a.c. source increases from zero, thus providing an indication that the temperature to be sensed has been reached.

3,937,990

ULTRASONIC COMPOSITE DEVICES

Ronald H. Winston, 18 E. 73rd St., New York, N.Y. 10019

Filed May 28, 1974, Ser. No. 474,044
Int. Cl.² H01L 41/04, 41/18
U.S. Cl. 310—8.3 **56 Claims**

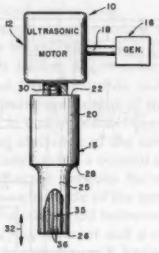
35. An ultrasonic system, comprising:

A. an ultrasonic motor,

B. a mechanical energy transmitting member including:

1. a plurality of vibration transmitting components, each having an average cross-sectional area and length substantially less than the longitudinal length or cross-sectional area of the tool, and

2. means for coupling said components together along the longitudinal length and circumferentially of each component to form a bond therebetween so as to obtain a unitary rigid composite structure containing the plural-



ity of vibration transmitting components substantially uniformly oriented throughout said member and bonded together along the longitudinal length and outer surface thereof such that mechanical vibrations of predetermined frequency are adapted to be transmitted through said coupling means and the plurality of vibration transmitting components, and

C. means connecting said energy transmitting member to said ultrasonic motor.

3,937,991

ELECTROACOUSTIC TRANSDUCERS OF THE BILAMINAR FLEXURAL VIBRATING TYPE AND METHOD FOR MANUFACTURING SAME

Frank Massa, Cohasset, and Gilbert C. Barrow, Scituate, both of Mass., assignors to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust, Cohasset, Mass.

Continuation-in-part of Ser. No. 17,430, March 9, 1970, abandoned. This application Dec. 8, 1971, Ser. No. 206,043
Int. Cl.² H01L 41/04
U.S. Cl. 310—9.1 **12 Claims**

1. An electroacoustic transducer comprising a bilaminar vibratile element having at least two plate members bonded together in face-to-face relationship, at least one of said bonded plates being piezoelectric material with electrode surfaces thereon, electrical conductor means connected to said electrode surfaces, vibratile plate mounting means comprising a structural support member having an opening therein for receiving said vibratile plate with a space separating the entire periphery of the plate and the support, flexible rubber-like support means for attaching said bilaminar vibratile element to said structural support member, said vibratile element having flexural vibrations responsive to an application of alternating voltage to said electrical conductors, said flexible support means comprising a plurality of resilient spot members spanning said peripheral space between the plates and said support member for holding said vibratile element in a predetermined spacial relationship without any direct contact with said structural support member, said resilient spot members being attached to said vibratile element in the vicinity of the nodal points established in said vibratile element when said vibratile element is operating at its fundamental resonant frequency mode of vibration.

3,937,992

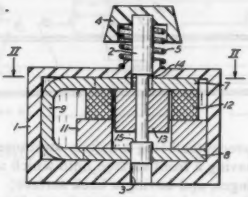
PULSE KEYBOARD SWITCH

Erle I. Shobert, II, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

Filed Nov. 18, 1974, Ser. No. 522,026
Int. Cl.² H02K 35/06
U.S. Cl. 310—15 **5 Claims**

1. A pulse keyboard switch comprising an annular perma-

nent magnet having an open center, a plate of soft magnetic material disposed against one side of said magnet, a stationary electric coil at the opposite side of the magnet and coaxial therewith, the coil having an open center, an unrestrained free-flying member of soft magnetic material coaxial with said magnet and coil, said member being small enough to move axially in the open centers of said coil and magnet toward and away from said plate, keeper means normally holding said free-flying member in a predetermined rest position away from the plate, means movable relative to the free-flying



member for first engaging and then pushing that member toward said plate until the magnetic attraction between said magnet and free-flying member causes said member to fly from said pushing means through said magnet to said plate at increasing high velocity, whereby a rapid change in flux in said free-flying member is created and produces a voltage pulse in said coil, and movable means for returning said member to said keeper means, said returning means being spaced from said free-flying member while it is flying to said plate.

3,937,993

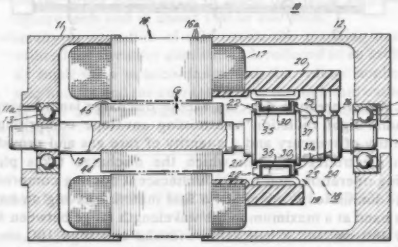
COMMUTATING STRUCTURE FOR DC MACHINES

Samuel Noodleman, Blacksburg, Va., assignor to Kollmorgen Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 471,313, May 20, 1974, Pat. No. 3,876,892, which is a continuation-in-part of Ser. No. 383,883, July 30, 1973, Pat. No. 3,819,964. This application Aug. 30, 1974, Ser. No. 502,213. The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.

Int. Cl.² H02K 37/00

U.S. Cl. 310—46 **20 Claims**



1. Switching apparatus for a machine responsive to a source of DC power and having interacting rotor and stator assemblies which rotate relative to each other wherein said stator has a winding having a plurality of energizeable coils, said coils having an annular array of commutator bars associated therewith for supplying electrical power thereto, and said rotor has a magnetic assembly associated therewith, said apparatus comprising:

a. first and second annular brush rings associated with said rotor;

b. first and second brush means associated with said stator for respectively coupling said first and second brush rings to opposite polarities of said DC source;

c. first roller contact means associated with said rotor and electrically connected to said first brush ring for progressively and sequentially engaging said commutator bars to thereby momentarily couple said commutator bars to said first brush ring; and

d. second roller contact means associated with said rotor and electrically connected to said second brush ring for progressively and sequentially engaging said commutator bars to thereby momentarily couple said commutator bars to said second brush ring.

3,937,994

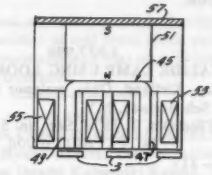
MAGNETIC SPEED SENSOR

Rex Wallace Presley, Livonia, and Jack Richardson Lorraine, Howell, both of Mich., assignors to The Bendix Corporation, South Bend, Ind.

Filed June 13, 1974, Ser. No. 478,989

Int. Cl.² H02K 21/38

U.S. Cl. 310—168 **10 Claims**



1. A speed sensor for a vehicle wheel comprising a tone wheel driven by the vehicle and subject to axial misalignment and vibration, the tone wheel being made of magnetic material and having a plurality of teeth, and sensing means having a pair of poles of magnetic material proximate the tone wheel teeth, coil means on the poles, and a permanent magnet having one of its poles connected to the poles on the sensing means for magnetizing the poles on the sensing means to induce a signal voltage in the coil means corresponding to wheel speed upon rotation of the tone wheel relative to the sensing means, the poles on the sensing means being phased relative to the teeth on the tone wheel to reduce noise voltage components in the wheel speed signal voltage due to axial misalignment and vibration of the tone wheel, and a substantially U-shaped shield connected to the other pole of the permanent magnet and enclosing a substantial portion of the sensing means from electromagnetic noise, a portion of the U-shaped shield being positioned adjacent the tone wheel remote from the teeth to provide a return path for magnetic flux.

3,937,995

HIGH VOLTAGE GROUNDING STRAP

Albert P. DeVito, Glenview, Ill., assignor to Palmer Industries Ltd., Chicago, Ill.

Filed Dec. 5, 1974, Ser. No. 529,615

Int. Cl.² H01J 31/00

U.S. Cl. 313—49 **8 Claims**

1. A high voltage grounding strap connected to the graphite coating of a cathode ray tube, said grounding strap comprising

a connector device having a base with opposing sides, a plurality of independently extending resilient members attached to a first edge of said base, at least one male connector being attached to the edge opposite the first edge of said base, said connector device being electrically connected to the graphite-coated periphery of the cathode ray tube with said resilient members closely conforming to and making electrical contact with the graphite-coated periphery of the cathode ray tube, an electrically conductive strap, a connector means affixed to one end of said strap, said connector means formed as flattened oval having a flared top receiving said male connector therein, metal strips depending from said top, said metal strips having lengthwise openings therebetween, one of said metal strips having an impression thereon facing the interior of the connector means and bearing against and securing said male connector inserted therein, said openings enabling said strips to resiliently deform for facilitating release of said male connector, and insulation sheathing covering the entire electrically conductive strap thereby inhibiting corona discharge and arcing therefrom.

3,937,996

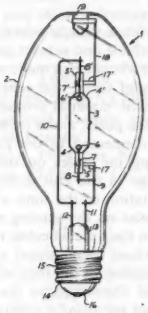
METAL HALIDE LAMP USING LOOP ELECTRODES

Daniel M. Cap, Kirtland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 7, 1974, Ser. No. 512,705

Int. Cl.² H01J 61/06

U.S. Cl. 313—217 **10 Claims**



1. A metal halide vapor arc lamp comprising:
a fused silica envelope;
an ionizable filling within said envelope comprising mercury, an inert starting gas and metal halide including at least one pyrolytically decomposable metal halide of low work function capable of serving as activator of a higher work function refractory metal to promote electron emission therefrom;
and electrodes sealed into opposite ends of said envelope, said electrodes being of refractory metal wire formed into open loops with their axes normal to the inter-electrode axis, said lamp operating with a temperature distribution permitting condensation of metal from said pyrolytically decomposable metal halide on said electrodes.

3,937,997

CATHODE-RAY TUBE SIGNAL GENERATOR HAVING RESISTANCE CONFIGURATED ELECTRON RECEPTOR

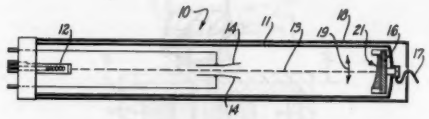
Dene Barrett, 15608 Delcombre Ave., Paramount, Calif. 90723

Filed Sept. 13, 1974, Ser. No. 505,768

Int. Cl.² H01J 31/02

U.S. Cl. 313—418 **11 Claims**

1. In combination with a cathode-ray tube having means for producing an electron beam, means for deflecting said electron beam, and a collector electrode for collecting the electrons of said electron beam, the improvement comprising:
a resistance configurated electron receptor positioned to be impinged upon by said electron beam as said electron beam is deflected by said deflection means;
the resistance of said resistance-configurated electron-receptor varying longitudinally along the area presented to the electron beam, being adapted to produce an output signal corresponding to a desired waveform;



said electron-receptor being a unitary structure of resistive material, having a front surface onto which said electron beam impinges, and having a back surface;
the front-surface/back-surface direction defining the longitudinal direction of said electron-receptor;
the entire back-surface of said electron-receptor being in electrical contact with said collector-electrode.

3,937,998

LUMINESCENT COATING FOR LOW-PRESSURE MERCURY VAPOUR DISCHARGE LAMP

Judicus Marinus Pieter Jan Verstegen; Dragutin Radielovic, and Lambertus Wilhelmus Johannes Manders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 25, 1974, Ser. No. 509,142

Claims priority, application Netherlands, Oct. 5, 1973, 7313694

Int. Cl.² H01J 61/44

U.S. Cl. 313—487 **9 Claims**

1. A low-pressure mercury vapour discharge lamp having a vacuum tight radiation transmitting envelope comprising a quantity of mercury and a quantity of rare gas and provided with electrodes between which the discharge takes place during operation, and with a luminescent coating comprising three luminescent materials, a first material having an emission band at a maximum in the wavelength range between 430 and 490 nm and a half value width of less than 100 nm, a second material mainly having its emission in the wavelength range between 520 nm and 565 nm, and a third material mainly having its emission in the wavelength range between 590 and 630 nm, wherein said second luminescent material is activated by terbium and is selected from the group consisting of materials defined by the formulas:

$Ce_{1-x-y}La_xTb_yMgAl_{11}O_{19}$ and (a)

$(Ce_{1-x-y}La_xTb_y)_2O_3 \cdot nAl_2O_3$ (b)

in which

$0 \leq x \leq 0.50$

$0.20 \leq y \leq 0.50$

$x+y \leq 0.90$

$10 \leq n \leq 12$

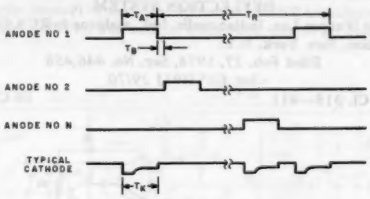
and in which up to a maximum of 25 at% of aluminum may be replaced by elements selected from the group consisting of gallium and scandium and in which magnesium may at least in part be replaced by one or more elements selected from the group consisting of zinc and beryllium.

3,937,999

REDUCTION OF BLANKING REQUIREMENTS IN A GASEOUS GLOW DISCHARGE DISPLAY TUBE HAVING A PLURALITY OF DIGITS

Dan J. Schott, Scottsdale, Ariz., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Oct. 17, 1973, Ser. No. 407,130
Int. Cl.² H05B 37/00
U.S. Cl. 315—169 TV 12 Claims



10. A multiplexed multiple character multi-anode, raised planar cathode gaseous glow discharge display device comprising

a plurality of groups of raised planar cathodes, each group arranged in a character forming pattern,

connection means for electrically connecting corresponding cathodes in each group to each other to enable electrical potentials to be applied simultaneously to selected corresponding electrodes in each group,

a plurality of operatively adjacent anodes operatively associated with said groups of cathodes respectively,

means for individually energizing said anodes in a predetermined order,

envelope means enclosing said cathodes and anodes, and

a prescribed mixture within said envelope means comprising neon and argon with said argon constituting approximately from 0.1 percent to 0.8 percent of said mixture, said device cathodes being disposed at heights of from at least one to a few mils and operated at minimum current density and maximum anode-cathode voltage conditions on the order respectively of about one-tenth ampere per square inch and at about 100 to 200 volts;

whereby in operation of said device the blanking interval utilized for streamer elimination is reduced to an arbitrarily small value in accordance with the voltage applied to said anodes and the current density through said cathodes as well as in accordance with electrode geometry and spacing.

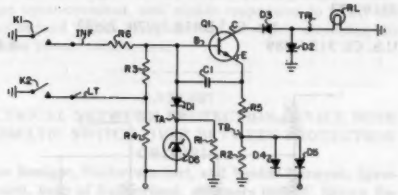
3,938,000

LAMP DRIVER FOR TELEPHONE PANEL INDICATOR LAMPS

Carlos S. Higashide, Elk Grove Village, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Apr. 29, 1974, Ser. No. 465,212
Int. Cl.² H05B 37/00
U.S. Cl. 315—205 3 Claims

1. A lamp driver for switching electrical current from a power source to an incandescent lamp whose resistance is low during the first moments of application of power thereto; said lamp having one terminal connected to a first terminal of said power source, said lamp driver including a transistor having a base, a collector, and an emitter, a biasing diode having an anode and a cathode, said collector electrically connected to said incandescent lamp and said emitter electrically connected to a second terminal of said power source via said biasing diode in the anode to cathode direction, a zener diode in series with a first resistor having its anode connected to said second terminal and said resistor to said first terminal of said power source, said base electrically connected to a control input terminal operative to cause said transistor to begin conduction, and to said second terminal of said power source via a second resistor for maintaining said transistor in a non-



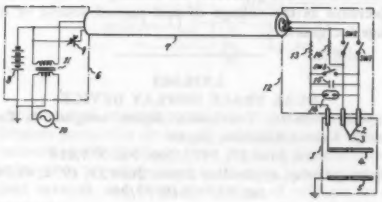
conducting state and an isolating diode having its cathode connected to the junction of said zener diode and first resistor for maintaining a predetermined bias on said base during the conduction of said transistor.

3,938,001

PROTECTION CIRCUIT FOR ELECTRON GUN

Susumu Ota, and Ryuzo Aihara, both of Akishima, Japan, assignors to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 26, 1974, Ser. No. 445,955
Claims priority, application Japan, Mar. 3, 1973, 48-25452
Int. Cl.² H01J 29/70
U.S. Cl. 315—381 6 Claims



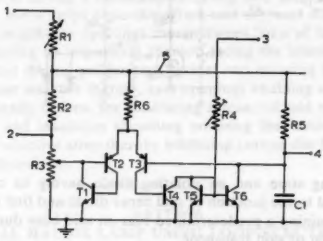
1. A field emission type electron gun comprising an electron gun chamber (1) containing a filament (2) for supporting and heating an emitter (3), a first electrode (4) for generating a strong electric field at the emitter tip, and a grounded anode (5), a power unit (6) containing a d.c. high voltage power source (8) for maintaining the filament (2) and first electrode (4) at negative high potential, and a power source (10) for supplying heating current to said filament (2), an insulating cable (7) for connecting the power unit (6) and the electron gun chamber (1) via an electric wiring changeover chamber (12) located between said insulating cable (7) and said electron gun chamber (1), said chamber (12) containing high order resistors (13 and 14) located in the d.c. high voltage power source (8) and first electrode (4) line circuit and the power source (10) and filament (2) line circuit respectively, for preventing the electric charge stored in the stray capacity of the insulated cable (7) and in the capacitance of power sources (8 and 10) from discharging an excess current, within said changeover chamber (12) a changeover means (SW3) being connected between the emitter (2) and the first electrode (4) in order to provide a normal operating mode when open and a conditioning operating mode for increasing the in-vacuo withstand voltage in the gun chamber when closed.

3,938,002

FIELD DEFLECTION CIRCUIT

Alan John Terry, London, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 24, 1974, Ser. No. 491,612
Claims priority, application United Kingdom, July 24, 1973, 35109/73
Int. Cl.² H01J 29/70, 29/72
U.S. Cl. 315—389 8 Claims



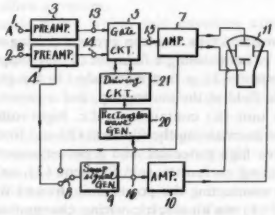
1. A field deflection circuit arrangement in which the flyback pulse produced across the deflection coil is clamped to a fixed potential, said deflection circuit comprising a sawtooth wave generator means adapted to be connected to a first source of direct voltage for producing a waveform having a scan period and a flyback period, said flyback period increasing as the amplitude of the sawtooth wave increases, said generator means having a control input means for varying said flyback period, an output stage adapted to be connected to a second source of direct voltage, and means for feeding said second source of direct voltage to said control input means of said sawtooth wave generator for causing the flyback period to decrease as the voltage of said second source of direct voltage increases.

3,938,003

DUAL TRACE DISPLAY DEVICE

Kazuyoshi Shimizu, Yokohama, Japan, assignor to Leader Denshi Kabushikikaisha, Japan

Filed June 27, 1973, Ser. No. 374,018
Claims priority, application Japan, June 29, 1972, 47-76840
Int. Cl.² G01R 13/28
U.S. Cl. 315—392 5 Claims



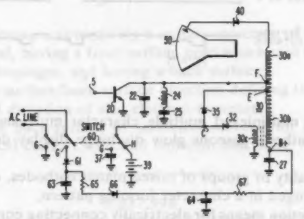
1. A dual trace display device comprising:
a. two input terminals supplied with two signals to be displayed, respectively,
b. a gate circuit connected to receive said two input signals,
c. a sweep signal generator producing a signal in synchronism with one of said two input signals,
d. a rectangular waveform generator connected to receive the output from said sweep signal generator and producing an output signal,
e. a driving circuit connected to receive the output from said rectangular waveform generator, producing a pair of signals with opposite polarities and applying said signals to said gate circuit to alternatively pass said two input signals through said gate circuit, and
f. a display device connected to receive the outputs from said gate circuit and said sweep signal generator and display thereon said input signals with the same reference axis and simultaneously in a time sequential manner.

3,938,004

DEFLECTION SYSTEM

David Warren Luz, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1974, Ser. No. 446,458
Int. Cl.² H01J 29/70
U.S. Cl. 315—411 10 Claims



1. A deflection system selectively operable either from a first rectified and filtered alternating current line voltage supply or from a second substantially lower voltage direct current voltage supply, comprising:
a deflection winding;
a deflection current generator coupled to said deflection winding for generating in said deflection winding deflection current having trace and retrace intervals;
switching means; and
a transformer having at least a first winding coupled to said deflection current generator and to said first and second voltage supplies, said first and second supplies being coupled to said transformer at first and second points respectively for having excited at said first and second points respectively voltages substantially equal to said first supply voltage and to said second supply voltage during said trace interval, said second supply being coupled to said second point through said switching means having a first state for coupling said second supply to said second point during at least a portion of said trace interval and having a second state for decoupling said second supply from said second point during at least a portion of said retrace interval.

3,938,005

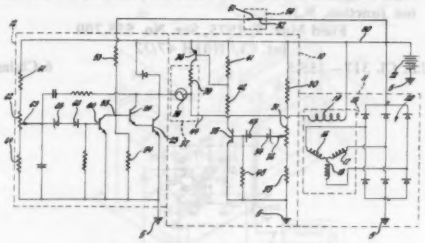
ELECTRICAL GENERATING SYSTEM OVERVOLTAGE PROTECTION CIRCUIT

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 25, 1974, Ser. No. 526,538
Int. Cl.² H02H 3/20
U.S. Cl. 317—13 R 5 Claims

1. An electrical generating system overvoltage protection circuit comprising in combination with an electrical generating system including an electrical generator having a field coil connected in series with the current carrying elements of a field coil energizing circuit electrical switching device across a source of energizing voltage and a voltage regulator circuit which operates the current carrying elements of the electrical switching device to the electrical circuit closed and open conditions in response to generator output voltage below and above a predetermined level, respectively: a thermally sensitive fuse element connected in series with said generator field

coil and said current carrying elements of said field coil energizing circuit electrical switching device; an electrically energizable heater element in heat transfer relationship with said thermally sensitive fuse element; a voltage divider network including a potentiometer having a movable contact; means for applying the generating system output voltage across said voltage divider network; and NPN transistor having base, collector and emitter electrodes; a Zener diode; means for connecting said Zener diode in an inverse polarity relationship across said base electrode of said NPN transistor and said movable contact of said potentiometer; a PNP transistor having base, collector and emitter electrodes; means for connecting said emitter-base electrodes of said PNP transistor in series with said collector-emitter electrodes of said NPN transistor; means for applying the generating system output voltage across said collector-emitter electrodes of said NPN transistor and the series combination of said emitter-base electrodes of said PNP transistor and said collector-emitter electrodes of said NPN transistor; and means for applying the generating system output voltage across the series combination of said emitter-collector electrodes of said PNP transistor, said heater element, said thermally sensitive fuse element and said current carrying elements of said field coil energizing circuit electrical switching device.



3,938,006

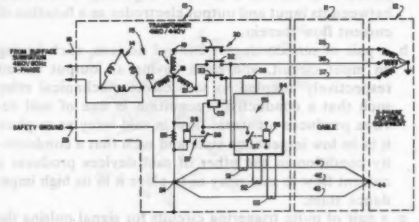
ACTIVE NEGATIVE SEQUENCE CABLE MONITOR

Govind Rao Gadwal, Bradford, Pa., and Eldon Keith Stanek, Morgantown, W. Va., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Feb. 5, 1975, Ser. No. 547,276

Int. Cl.[2] H02H 3/16

U.S. Cl. 317—18 C **14 Claims**



1. Apparatus for detecting a broken ground conductor in a polyphase A.C. cable having a separate power conductor for each phase and an equal number of ground conductors, said power conductors normally carrying a set of balanced positive-sequence currents, said conductors being reactively coupled together so that currents are induced in the ground conductors in response to currents flowing in the power conductors, positive-sequence currents normally being induced into the ground conductors by the power conductors, comprising means coupled to the ground conductors for sensing a negative-sequence current induced in the ground conductors and for deriving a first signal indicative of a negative-sequence current being sensed, means coupled to the conductors for deriving a second signal indicative of no current flowing in the ground conductors because a plurality of the ground conductors are open-circuited, and means responsive to either the first or second signal being derived for open circuiting the polyphase power conductors.

3,938,007

ELECTRICAL NETWORK PROTECTION DEVICE WITH AUTOMATIC SWITCH OVER BETWEEN PROTECTION CRITERIA

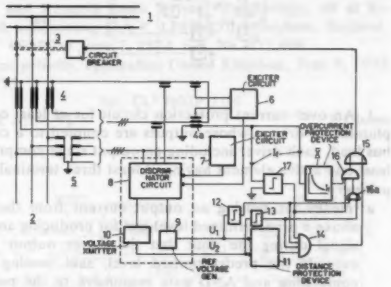
Jacques Boniger, Niederrohrdorf, and Venkat Narayan, Spreitenbach, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed May 23, 1974, Ser. No. 472,805

Claims priority, application Switzerland, May 30, 1973, 7781/73

Int. Cl.[2] H02H 3/38

U.S. Cl. 317—27 R **9 Claims**



1. An electrical network protection device comprising:

a distance protection device (11) coupled to said electrical network and indicating a fault condition in said network responsive to voltage signals (U_1 and U_2) derived from said network and being a function of voltages in said network;

an overcurrent protection device (X) coupled to said electrical network and indicating a fault condition in said network responsive to a current signal (I_f) derived from said network and which is a function of current flowing in said network;

circuit breaker means (3) coupled to said electrical network;

a threshold-value logic system coupling said distance protection device (11) and said overcurrent protection device (X) to said circuit breaker means (3) and including OR gate means (15) having an output operatively coupled to said circuit breaker means (3) and having two inputs, one of which is coupled to an output of said distance protection device (11) and the other of which is coupled through additional gating means to the output of said overcurrent protection device (X), said additional gating means comprising first AND gate means (16) having one input coupled to the output of said overcurrent protection device (X) and a further input gating means (16*a*) coupled with said first AND gate means and having inputs coupled to said voltage signals (U_1, U_2) through respective first threshold switches (12, 13) which deliver output signals when the corresponding voltage signals (U_1, U_2) exceed predetermined threshold values, the output signal of said first AND gate means (16) depending on at least one of said voltage signals (U_1, U_2)

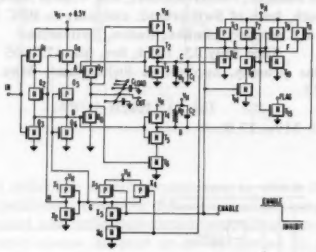
failing to exceed the corresponding one of said predetermined threshold values.

3,938,008

COMMON BUS DRIVER COMPLEMENTARY PROTECT CIRCUIT

Ronald W. Knepper, La Grangeville; Ralph D. Lane, Wappingers Falls; Peter J. Ludlow, Hopewell Junction, and Barry L. Moore, Middletown, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 18, 1974, Ser. No. 507,111
Int. Cl.² H02H *3/08, 7/20*
U.S. Cl. 317—31 **6 Claims**



1. An over current protection circuit for at least one of a plurality of drivers whose outputs are coupled to a common bus load, each driver including an output stage comprising at least one active element having at least three terminals, comprising:

a. means for sensing an output current from the driver above a predetermined level and for producing an output signal during the time that the driver output current exceeds the predetermined level, said sensing means comprising and AND gate responsive to the potentials across at least two pairs of the three terminals of the active element,

b. capacitor means coupled to the sensing means output for accumulating and storing a charge proportional to the time integral of the output signal,

c. a bistable latch coupled to the capacitor means and adapted to be triggered thereby in response to the accumulated charge reaching a predetermined level, and

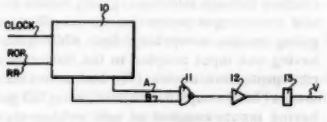
d. gate means coupled between the latch and the driver for disabling the driver in response to the triggering of the latch.

3,938,009

PRECISION CONTROL OF RELAY OPERATE AND RELEASE TIMES

John A. Gauthier, Brockville, Canada, assignor to GTE Automatic Electric (Canada) Limited, Brockville, Canada

Filed Sept. 27, 1974, Ser. No. 510,085
Int. Cl.² H03H *9/00*
U.S. Cl. 317—148.5 R **3 Claims**



1. A system for varied accurate relay operate and release times including, a relay, a free running clock producing clock pulses, and relay operate and release signals, said system comprising:

a single shift register device having one input coupled to said clock pulses and a second input coupled to said relay operate and release signals;

a single output gate means coupled to said shift register device; and

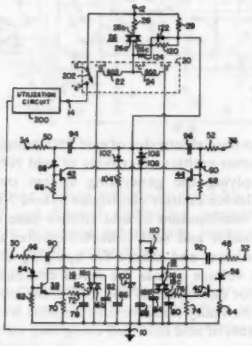
relay driver means coupled to said output gate means and to said relay.

3,938,010

CONTROLLABLE ELECTRICAL SWITCH

Donald Charles Long, Yardley, Pa.; Albert Charles Hartsough, Willingboro, and Robert Fincher Sanford, Titusville, both of N.J., assignors to Princeton Electro Dynamics, Inc., Princeton Junction, N.J.

Filed Mar. 5, 1975, Ser. No. 555,700
Int. Cl.² H01H *47/32*
U.S. Cl. 317—155.5 **6 Claims**



1. A controllable electrical switch, comprising:

first and second terminals; and

actuating means for making electrical connection between said terminals when closing said switch, and for breaking said electrical connection when opening said switch;

said actuating means including:

a. a bistable electromechanical relay having an input electrode coupled to said first terminal and an output electrode coupled to said second terminal, and conditionable to one of a low and high impedance state between its input and output electrodes as a function of current flow therein;

b. a pair of semiconductor control devices, each having an input circuit, and each having an output circuit respectively coupled to said electromechanical relay such that a conductivity condition in one of said devices produces a current flow in said relay as to place it in its low impedance state and such that a conductivity condition in the other of said devices produces a current flow in said relay as to place it in its high impedance state;

c. a pair of pulse triggering circuits for signal pulsing the input circuits of said semiconductor control devices to change the conductivities thereof, with said changes in conductivity conditions serving to change the current flow through the output circuits of said control devices to change the impedance state of said bistable relay in actuating said electrical switch from a make to a break condition and vice versa;

d. a first power supply means for energizing said bistable electromechanical relay and said pair of semiconductor control devices; and

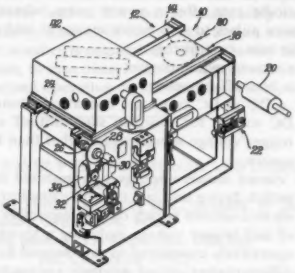
e. a second power supply means for energizing said pulse triggering circuits at a lower potential than energizes said bistable relay and said pair of control devices.

3,938,011

TAPE DEGAUSSER

Arthur K. Littwin, 2235 N. Knox Ave., Chicago, Ill. 60639

Filed Aug. 20, 1973, Ser. No. 389,578
Int. Cl.² H01F 13/00
U.S. Cl. 317—157.5 MR **4 Claims**



1. Apparatus for degaussing a magnetized tape wound in a reel about an axis and constituting bulk or mass form, comprising

conveyor means for conveying the tape continuously in a path extending longitudinally through the apparatus,

degaussing units in juxtaposition to the path and in close juxtaposition to the tape as the tape is conveyed along the path, the degaussing units being operative for impressing degaussing magnetic fields on the tape, and

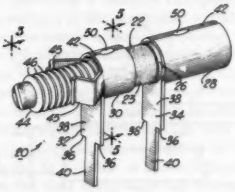
means for adjustably driving the conveyor means at progressively reduced speeds and correspondingly adjustably reducing the magnetic field of the degaussing means to a level approximating zero while the tape is in the range of and passing the degaussing units.

3,938,012

VARIABLE CAPACITOR

Vincent J. Patti, Norridge, Ill., assignor to Standex International Corporation, Andover, Mass.

Filed Jan. 28, 1974, Ser. No. 436,865
Int. Cl.² H01G 5/24
U.S. Cl. 317—249 T **13 Claims**



1. A capacitor comprising

means for electrically connecting said capacitor into an electrical circuit, said electrically connecting means comprising a first, elongated, generally tubularly shaped, radially outwardly expandable, conductive member, said first conductive member including a first elongated slot extending along the entire length of said first conductive member, and a second, elongated, generally tubularly shaped, radially outwardly expandable, conductive member, said second conductive member including a second elongated slot extending along the entire length of said second conductive member,

means electrically insulating said first and second conductive members, said electrically insulating means comprising an elongated, generally tubularly shaped, radially outwardly expandable, dielectric member received within said first and second conductive members, said first and second conductive members being spaced apart along the length of said dielectric member, said dielectric member including a third elongated slot extending along the entire length of said dielectric member, and

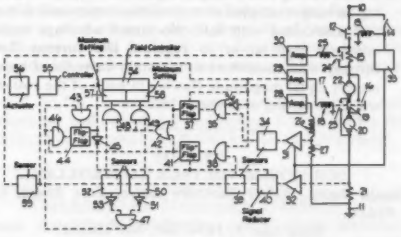
means radially outwardly expanding said first and second conductive members and said dielectric member to thereby increase the widths of said first, second and third slots, said expanding means comprising an elongated conductive member received within said dielectric member and electrically short circuited to said first conductive member.

3,938,013

D.C. MOTOR CONTROL SYSTEM EFFECTING CHANGES IN THE CONNECTIONS OF THE ARMATURE AND VARIATIONS IN CURRENT FLOW THROUGH THE FIELD

Alec Harry Seilly, North Wembley; Kenneth Clive Scott, London, and Kenneth Leslie Driver, Weighbridge, all of England, assignors to C.A.V. Limited, Brimingham, England

Filed June 7, 1974, Ser. No. 477,408
Claims priority, application United Kingdom, June 9, 1973, 27574/73
Int. Cl.² H02P 1/16
U.S. Cl. 318—92 **5 Claims**



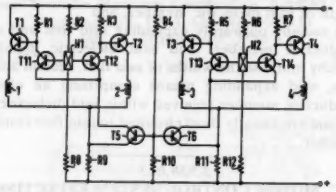
1. A d.c. motor control system comprising a pair of armature windings mounted on a single rotor or on a pair of mechanically coupled rotors, a field winding or windings, the system including switch means operable to effect a change in the electrical connections of the armature windings to a pair of electric supply terminals, and means for effecting variation of the current flowing in the field winding or windings, said switch means comprising a contactor, the contactor serving in one condition to place said windings in series with each other and in the other condition in parallel with each other, said means for effecting variation in the current flowing in the field winding or windings comprising an operator controlled member, and a field current controller of the chopper type, said field current controller receiving a first control signal from said operator controlled member and acting to reduce the current flowing in the field windings when it is required to accelerate the motor, a power amplifier being further provided intermediate the controller and the field winding, said system additionally including means for providing a field current signal representative of the field current, means for providing an armature current signal representative of the armature current, switch means operable to control said contactor, said switch means being operated to cause the contactor to connect said armature windings in the correct parallel or series mode when the armature and field current are at predetermined values.

3,938,014

BRUSHLESS D-C MOTOR

Toshitaka Nakajima, Matsumoto, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 14, 1974, Ser. No. 442,681
Claims priority, application Japan, Feb. 16, 1973, 48-19065
Int. Cl.[2] H02K 29/00
U.S. Cl. 318—138 8 Claims



1. In a brushless d-c motor having a permenant magnet rotor and a plurality of stator windings with at least two of the stator windings having a lead in common and further including means to successively energize the stator windings using commutation transistors, in dependence of the angular position of the rotor, the improvement comprising:

a. a resistor coupling two stator windings in common to a voltage terminal to develop a voltage output representing the current flowing in the stator windings with which it is associated; and

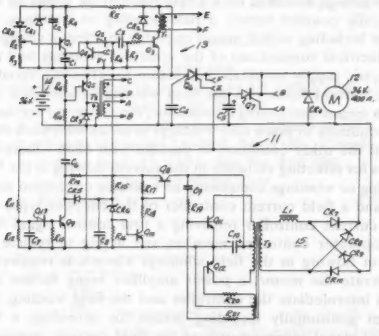
b. means having said voltage output as an input and providing an output coupled to control the commutation transistors associated with said two stator windings having a common lead so as to regulate the current flowing through said transistors to maintain currents of approximately equal magnitude flowing in each of the two stator windings having a common lead.

3,938,015

SCR MOTOR VOLTAGE CONTROLLER

Ronald Beebe, 32960 Parkview Drive, Fort Bragg, Calif. 95437

Filed Apr. 5, 1974, Ser. No. 458,127
Int. Cl.[2] H02P 7/06
U.S. Cl. 318—139 10 Claims



1. A motor speed controlling system comprising in combination:

a. a DC source;

b. DC motor means;

c. a main pass switch device connecting said source to said motor means;

d. means to turn on said main pass switch device at a constant periodic rate, comprising:

i. a constant current circuit connected to said DC source;

ii. a turn-on capacitor;

iii. means to charge said turn-on capacitor from said constant current circuit;

iv. a first transformer;

v. circuit means to apply a pulse to the input of said first transformer responsive to a predetermined charge level of said turn-on capacitor; and

vi. means operatively connecting said first transformer to said main pass switch device;

e. means to turn off said main pass switch device at said periodic rate after a power pulse, whereby to deliver power pulses to said motor means at said constant periodic rate, comprising:

i. a second switch device;

ii. a turn-off capacitor;

iii. a DC to DC converter operatively connected to said DC source for charging said turn-off capacitor to a trigger voltage substantially higher than that of the DC source;

iv. circuit means operatively connected to said second switch device and said turn-off capacitor acting to turn on said second switch device responsive to attainment of said trigger voltage including a second transformer operatively connected to said second switch device, a differentiating circuit drivingly connected to said second transformer and means to develop a driving pulse in said differentiating circuit responsive to the attainment of said trigger voltage;

v. circuit means to back-bias said main switch device to a turn-off state responsive to the turning on of said second switch device; and

vi. means to turn off said DC to DC converter simultaneously with the turning on of said second switch device responsive to the attainment of said trigger voltage; and

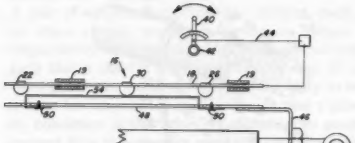
f. means to adjust the point of turn-on of said main pass switch device in its cycle, whereby to vary the width of the power pulses and correspondingly vary the effective voltage applied to said motor means.

3,938,016

ACTUATOR POSITION CONTROL

Henry James Lange, Juneau; Myron Lee McCunn, Horicon; Martin Adolph Berk, Horicon; Peter Jay Classen, Horicon, and David Thomas Allen, Horicon, all of Wis., assignors to Deere & Company, Moline, Ill.

Filed Sept. 18, 1974, Ser. No. 506,978
Int. Cl.[2] G05B 11/14
U.S. Cl. 318—467 6 Claims



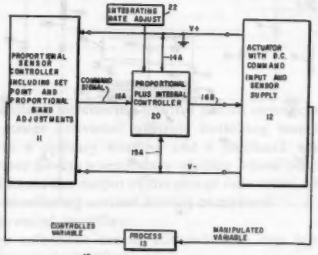
1. In a combination of an actuator including a reversible electric motor and a control for the motor wherein the combination is of a type including an electical energy source connected to the motor by circuitry including control switch means having a normal condition disconnecting the source from the motor and first and second operative conditions respectively connecting the source to the motor for effecting forward and reverse driving of the motor; a manually operable input member connected to the switch means for controlling

movement of the latter to its first and second operative conditions; a follow-up member connected to an output member of the actuator and to the switch means for restoring the latter to its neutral condition after the output member has undergone a predetermined movement corresponding to a selected setting of the input member, the improvement comprising: said input and followup members being mounted adjacent each other for relative movement along parallel first and second paths; said control switch means being entirely embodied in said input and follow-up members and including first electrical contact means carried by the input member and second electrical contact means carried by the follow-up member; said first and second electrical contact means being so arranged relative to each other that when the input and follow-up members bear a first spatial relationship to each other the neutral condition of the switch means exists and when the input member is respectively moved in said first and second directions, to thus disturb the first spatial relationship, the first and second operative conditions respectively exist.

3,938,017
ANTI-RESET WINDUP PROPORTIONAL AND INTEGRAL CONTROLLER

Thomas Edward Hayes, Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Mar. 5, 1974, Ser. No. 448,365
Int. Cl.² G05B 11/42
U.S. Cl. 318—610 **16 Claims**

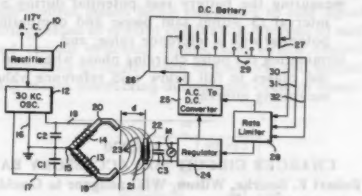


1. In a process control system having a proportional control loop including sensor means for monitoring a controlled variable and for providing a linearly changing command signal indicating deviations of the controlled variable from a system set point, and actuator means responsive to the command signal to control a manipulated variable to effect a change in the controlled variable to return the controlled variable to the set point, a proportional plus integral controller means comprising proportional means responsive to said command signal to provide a first signal proportional to said command signal, integral means operable when enabled to be responsive to said command signal to provide a second signal that varies in proportion to the time integral of the command signal, summing means for summing said first and second signals to provide a modified command signal for said actuator means and control means for normally enabling said integral means to provide said second signal, said control means having a first means for providing at least one reference signal of a predetermined value and second means for comparing said modified command signal with said reference signal and for controlling said integral means to vary the amplitude of said second signal by disabling said integral means whenever said modified command signal exceeds said predetermined value.

3,938,018
INDUCTION CHARGING SYSTEM

Ernest A. Dahl, 3747 Breaker Drive, Ventura, Calif. 93003

Filed Sept. 16, 1974, Ser. No. 506,530
Int. Cl.² H02J 7/10
U.S. Cl. 320—2 **4 Claims**



1. An apparatus for charging a D.C. rechargeable battery without physical conductors extending between a charging source and said battery, comprising in combination:

a. oscillator means for connection to said charging source for converting said source into a signal of given high frequency in the range from 10,000 to 40,000 cycles per second;

b. a transmitting coil means including powdered iron core means connected to the output of said oscillator means for radiating said signal, said transmitting coil means being tuned to said given high frequency;

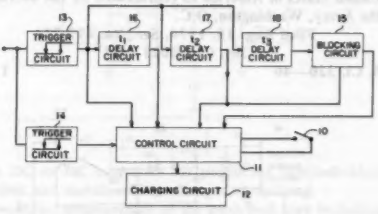
c. a receiving coil means including a powdered iron core spaced a given distance from said transmitting coil means substantially less than one wave length of said given high frequency so as to be inductively coupled with said transmitting coil means including first and second coils connected together at first ends to provide a common connection, said coils with their powdered iron core means being disposed at an angle to each other to direct the path of the generated electromagnetic field in a direction for maximum flux coupling with said receiving coil means over said given distance; and

d. A.C. to D.C. converter means connected between said receiving coil means and said battery for converting the inductively received signal into a D.C. charging signal.

3,938,019
CHARGING OF STORAGE BATTERIES

Gerhard Schmitt, Fim-Zeilsheim, and Gerhard Knierim, Fischbach, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Dec. 11, 1974, Ser. No. 531,557
Claims priority, application Germany, Jan. 2, 1974, 2400090
Int. Cl.² H02J 7/10
U.S. Cl. 320—21 **7 Claims**



1. A method of charging a storage battery, utilizing a heavy charging phase followed by a pulse charging phase, and comprising the steps of:

charging during said heavy charging phase with constant current until a predetermined battery voltage U1 is reached;

charging during the subsequent pulse charging phase with constant current pulses which include a charge-continuation interval *t*1 following the attainment of said battery voltage U1 in response to each said pulse;

shutting off the charging pulse at the end of each *t*1 interval for a pause of duration *t*2;

measuring the battery rest potential during a measuring interval *t*3 within said pause and comparing said rest potential with a reference value; and

terminating the pulse charging phase when said rest potential ceases to fall below said reference value during a measuring interval.

3,938,020

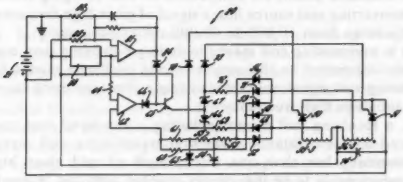
CHARGER CIRCUIT FOR ACCESSORY BATTERY

Robert F. Bourke, Wilson, Wis., assignor to Gould, Inc., Rolling Meadows, Ill.

Filed Feb. 11, 1975, Ser. No. 548,914

Int. Cl.² H02J 7/00; H02M 7/44

U.S. Cl. 320—21 **12 Claims**



12. A circuit for charging an auxiliary battery and usable with thyristor controlled resonant circuits of the type including a resonating inductance, said charging circuit comprising in combination, charging inductance means inductively coupled to the resonating inductance, switch means coupled to the charging inductance means, means for providing a first signal related to the peak voltage induced in said charging inductance means, means for producing a second signal following the voltage induced in said charging inductance means, means for comparing the first and second signals for producing a firing signal when said second signal reaches a magnitude which is a predetermined proportion of said first signal, and means coupling the firing signal to the switch means for causing said charging inductance means to take energy from the resonating inductance.

3,938,021

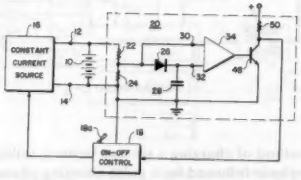
BATTERY CHARGING CIRCUIT WITH FULL-CHARGE CUTOFF

Melvyn S. Kosmin, Ocean Township, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 15, 1974, Ser. No. 497,773

Int. Cl.² H02J 7/04

U.S. Cl. 320—40 **1 Claim**



1. A battery charging circuit including overcharge protection for a battery being charged comprising:

a constant current source having a pair of output terminals,

a resistive voltage divider connected across the output terminals of the current source,

a series connected diode and capacitor connected across a resistor of the voltage divider with the diode in the forward direction to follow changes in the terminal voltage of a battery connected across the current source and being charged,

a high input impedance amplifier having a pair of input terminals connected across the diode,

a transistor amplifier including a collector resistor, the base of the transistor amplifier being connected to the output of the high input impedance amplifier to operate at saturation when the diode conducts, and to reduce current level abruptly when the diode ceases to conduct, and

on-off control means connected between the collector of the transistor amplifier and the constant current source for turning off the constant current source when the current level in the transistor amplifier is reduced abruptly.

3,938,022

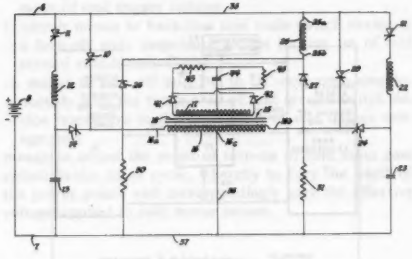
DC TO DC INVERTER CIRCUIT

William C. Staker, Springfield, and Richard N. Lehnhoff, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,024

Int. Cl.² H02M 3/315

U.S. Cl. 321—2 **6 Claims**



1. A DC to DC inverter circuit comprising: positive and negative polarity input circuit means; a transformer having at least a primary winding with two terminal ends and a center tap; first and second power silicon controlled rectifiers, each having anode and cathode electrodes; means for connecting each terminal end of said transformer primary winding to the same one of said input circuit means through the said anode-cathode electrodes of a respective one of said power silicon controlled rectifiers; means for connecting said transformer primary winding center tap to the other one of said input circuit means; first and second commutating capacitors; first and second charge circuit silicon controlled rectifiers, each having anode and cathode electrodes; first and second charge circuit inductor elements; means for separately connecting the series combination of said anode-cathode electrodes of one of said charge circuit silicon controlled rectifiers, one of said charge circuit inductor elements and one of said commutating capacitors and the series combination of said anode-cathode electrodes of the other one of said charge circuit silicon controlled rectifiers, the other one of said charge circuit inductor elements and the other one of said commutating capacitors across said positive and negative polarity input circuit means; a commutating silicon controlled rectifier having anode and cathode electrodes corresponding to each one of said power silicon controlled rectifiers; and means for connecting said anode-cathode electrodes of each of said commutating silicon controlled rectifiers across the positively charged plate of a respective one of said commutating capacitors and the said

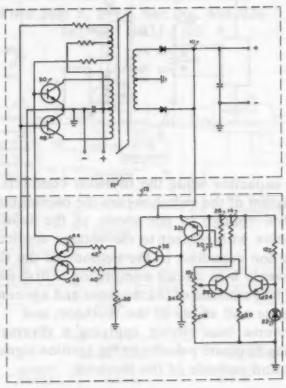
cathode electrode of the said power silicon controlled rectifier to which it corresponds.

3,938,023

VOLTAGE MONITOR AND CONTROL CIRCUIT

Homer F. Hutchinson, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Sept. 27, 1974, Ser. No. 509,751
Int. Cl.² H02M 3/335
U.S. Cl. 321—2 7 Claims



1. A voltage monitoring control circuit connected to a DC to DC power converter utilizing switching transistors connected to a primary winding and a feedback winding of a transformer having a secondary winding whose output is rectified and forms the output of the power converter, wherein said voltage monitoring control circuit comprises:

a differential amplifier;

voltage reference means connected to one input of said differential amplifier;

sensing means connected between said power converter output and said second input of said differential amplifier, said differential amplifier producing an output in response to voltage changes at said second input proportional in magnitude to said voltage changes;

shunting control means connected to said switching transistors of said power counverter, said shunting means including a control transistor connected across each of said switching transistors, the main current path of said control transistors connected across the base emitter junction of said respective switching transistors; and

translating means connected between said control leads of said junction control transistors and said output of said differential amplifier, said shunting control transistors controlling the base current of said switching transistors so as to regulate the output of said power converter.

3,938,024

CONVERTER REGULATION BY CONTROLLED CONDUCTION OVERLAP

Patrick William Clarke, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 6, 1975, Ser. No. 538,593
Int. Cl.² H02M 3/335
U.S. Cl. 321—2 11 Claims

1. In a DC to DC converter,

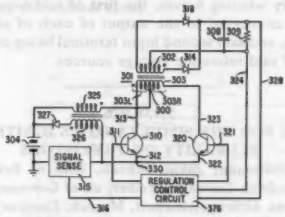
transformer means

first and second switching means coupled to said transformer means,

signal monitoring means responsive to a signal conducted by said transformer means,

switch control means to cyclically operate said first and second switching means,

said switch control means being responsive to said signal monitoring means to control conduction intervals of said first and second switching means, said switch control means operating to render each of said first and second switching means conducting during each cycle of operation for a time interval in excess of one-half the time period of each cycle of operation and nonconducting during each cycle of operation for a time interval less than one-half the time period of each cycle of operation, said first and second switching means thereby being alternately nonconducting and simultaneously conducting for a controlled time duration during each cycle of operation in order to maintain a predetermined regulated signal output magnitude to continuously energize a load at an output of said converter in response to the controlled time duration of simultaneous conduction.

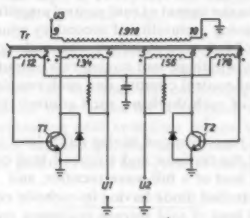


3,938,025

DC TO DC CONVERTER FOR PRODUCING TWO INDIVIDUALLY CONTROLLED AND STABILIZED DC-VOLTAGES

Rolf Erik Olof Gustafsson, Huddinge, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Oct. 2, 1974, Ser. No. 511,209
Claims priority, application Sweden, Oct. 17, 1973, 140923
Int. Cl.² H02M 3/335
U.S. Cl. 321—2 5 Claims



5. A DC to DC converter for producing two individually controlled and stabilized DC-voltages comprising:

an oscillator arrangement of the push-pull type including a transformer having a primary winding which is split into two halves each having an end terminal and a secondary winding having an output terminal;

a first and a second DC voltage;

means for connecting said first and second DC voltage to the respective half of said primary winding for determining the amplitude of the two half waves appearing on the output of said secondary winding;

first and second rectifier means each having an input terminal and an output terminal, said input terminal being connected to the output terminal of said secondary winding for rectifying the pulse formed output voltage on said output terminal;

a first and a second variable reference voltage source, said first rectifier means being a half wave rectifier and said second rectifier means being a peak-to-peak rectifier; and

first and second regulator means for providing said first and second DC voltage, each having a first and a second input terminal and an output terminal, said output terminal being connected to each of said end terminals of said primary winding halves, the first of said input terminals being connected to the output of each of said rectifier means, and said second input terminal being connected to one of said reference voltage sources.

3,938,026

CIRCUIT FOR THE SIMULTANEOUS IGNITION OF A PLURALITY OF THYRISTORS

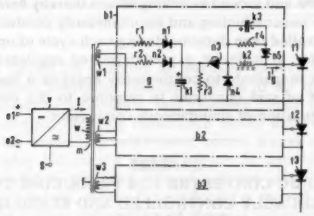
Manfred Hoffmann; Jakob Schenk, both of Erlangen, and Karl-Friedrich Leowald, Weiher, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 4, 1974, Ser. No. 520,849

Claims priority, application Germany, Nov. 21, 1973, 2358091

Int. Cl.² H02M 7/12

U.S. Cl. 321—27 R **10 Claims**



1. Apparatus for the simultaneous ignition of a plurality of series-connected thyristors comprising,

a control amplifier the output of which is an alternating current,

a pulse transformer, the primary windings of which are coupled to the output of said control amplifier, said transformer having a plurality of secondary windings,

a plurality of full-wave rectifiers, one each coupled to said secondary windings, and having two output leads,

a plurality of control circuits, one each coupled in the control path of each thyristor, each control circuit comprising,

a storage reactance coil having a first lead coupled to the grid of the thyristor and a second lead coupled to one output lead of a full-wave rectifier, and

an uncontrolled diode having its cathode coupled to said second lead of said storage reactance coil, and its anode coupled to the cathode of the thyristor and the other output lead of said rectifier.

3,938,027

ELECTRICAL THYRISTOR CIRCUIT

Hideo Iwamoto, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 12, 1974, Ser. No. 478,512

Int. Cl.² H02M 7/515

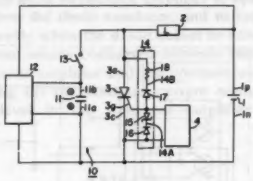
U.S. Cl. 321—45 C **22 Claims**

1. An electrical circuit comprising at least one thyristor having an anode, cathode and gate;

an ignition circuit for applying an ignition signal between the gate and cathode of the thyristor when turning on the thyristor;

a turn-off circuit for turning off the thyristor which applies a reverse voltage between the anode and cathode of the thyristor when turning off the thyristor and which comprises an inverse bias circuit;

said turn off circuit comprising a commutation capacitor connected by switch means across the anode and cathode of the thyristor, means for reverse charging the commutation capacitor while the thyristor conducts so that upon actuation of the switch means the commutation capacitor applies voltage to the anode of the thyristor which is negative with respect to the voltage applied by the commutation capacitor to the cathode of the thyristor;



said inverse bias circuit comprising a first path across the gate and cathode of the thyristor and a second path across the gate and anode of the thyristor; and

said inverse bias circuit applying a reverse bias voltage having opposite polarity to the ignition signal between the gate and cathode of the thyristor.

3,938,028

VOLTAGE REGULATOR FOR A SEPARATELY EXCITED GENERATOR

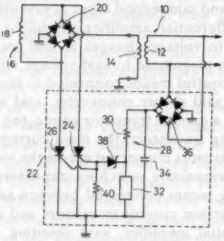
Yoshihiko Ikeda, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed July 5, 1974, Ser. No. 485,984

Claims priority, application Japan, July 9, 1973, 48-80540[U]

Int. Cl.² H02P 9/26

U.S. Cl. 322—28 **5 Claims**



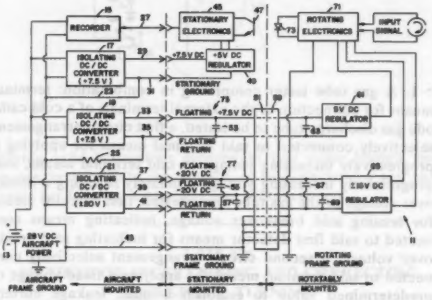
1. A voltage regulator for a separately excited generator including a main generator unit having generating winding means and exciting winding means and an exciter comprising a magnet field type generator with the output connected through a rectifier to said exciting winding means of said main generator unit, said voltage regulator comprising thyristor means connected to said output of said exciter to short the AC output from said exciter from being supplied to said exciting winding means of said main generator unit, a voltage divider with the input connected through a rectifier to the output of said generating winding means of said main generator unit, said voltage divider comprising first electric resistance means

and second electric resistance means, and a Zener diode, the cathode of said Zener diode being connected to the point of connection between said first electric resistance means and said second electric resistance means and the anode of said Zener diode being connected to the gate of said thyristor means, characterized in that said first electric resistance means of said voltage divider is non-linear in voltage to current characteristic.

3,938,029
LOW NOISE DC POWER SUPPLY SYSTEM FOR ELECTRONICS ON A ROTATING ASSEMBLY

Peter B. Wagner, and James W. Telford, both of Reno, Nev., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 5, 1974, Ser. No. 486,036
Int. Cl.² H02J 1/00
U.S. Cl. 323—2 **6 Claims**



1. A low noise D. C. power supply comprising:

a. a stationary assembly and a rotatable assembly;

b. a brush assembly operably connected to said stationary assembly and a slip ring assembly operably connected to said rotatable assembly;

c. said brush assembly including at least first, second and third brushes and said slip ring assembly including at least first, second and third slip rings, said first, second and third brushes being respectively operably connected to said first, said and third slip rings;

d. a stationary D. C. power source having one side connected to a stationary ground, to said third brush and to one input of a stationary D. C. to D. C. converter and the other side connected to the other input of said D. C. to D. C. counter;

e. a first ouput of said stationary D. C. to D. C. converter being connected to said first brush and a second output being connected to said second brush;

f. said first and second slip rings being connected to a D. C. regulator mounted on said rotatable assembly;

g. the output of said D. C. regulator being connected to one input of an electronic assembly mounted on said rotatable assembly; and

h. the ground of said electronics assembly and said second slip ring being connected to said third slip ring.

3,938,030
CONTROLLABLE POWER TRANSFERRING DEVICE UTILIZING A SHORT-CIRCUITED CONTROLLED REACTANCE

Lionel B. Cornwell, 52 Madison Springs Drive, Madison, Conn. 06443

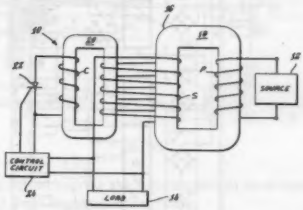
Filed July 18, 1974, Ser. No. 489,783
Int. Cl.² G05F 7/00
U.S. Cl. 323—50 **17 Claims**

1. A power transferring device of the type used for regulating or controlling the application of alternating current electric power to a load by means of a reactance controlled by selectively short-circuiting a control coil with a controllable short-circuiting switch, characterized by:

a power transformer having a power core and primary and secondary coils each encircling the power core and arranged for connection respectively to means acting as a source of alternating current electric power and to means forming a load;

a control core separate from the power core and encircled by the selectively short-circuited control coil;

one and only one of the primary or secondary coils being arranged to encircle both the control core and the power core, thereby to subject that coil to the controlled reactance of the control core;



the control core being arranged to subject the coil encircling both cores to essentially complete choking reactance without saturation of the control core when the control coil is open-circuited, thereby to substantially prevent power transfer between the primary and secondary coils;

the control coil loading the control core with the small resistance of the control coil and switch when the switch is short-circuited, thereby to transfer power substantially unimpeded between the primary and secondary coils;

whereby the control core and coil are enabled to efficiently control the transfer of power between the primary and secondary coils by selective opening and closing of the switch with little power dissipation occurring in the transferring device in either switch state.

3,938,031
ADJUSTABLE VOLTAGE POWER SUPPLY

Ronald C. Blackmond, Allison Park, Pa., assignor to Robicon Corporation, Pittsburgh, Pa.

Filed Sept. 3, 1974, Ser. No. 502,656
Int. Cl.² G05F 1/40, 1/66, 3/08
U.S. Cl. 323—23 **7 Claims**

1. An adjustable voltage alternating current power supply comprising two similar, substantially constant voltage sources, switching means for alternatively connecting said voltage sources in parallel or in series for connection to a load, and means for controlling said switching means to switch said voltage sources between parallel and series connections at predetermined points in each half-cycle of the applied voltage wave.

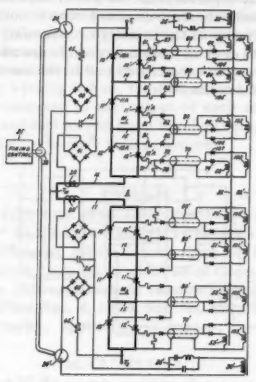
3,938,032
GATE PULSE POWER SUPPLY FOR STATIC ALTERNATING CURRENT SWITCH

Donald M. Demarest, Wallingford, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed May 21, 1974, Ser. No. 472,025
Int. Cl.² G05F 1/56
U.S. Cl. 323—24 **7 Claims**

1. Alternating current static switching apparatus for an electric power circuit comprising two oppositely poled branch circuits connected in parallel circuit relation between a pair of terminal cross connections, each said branch circuit including an equal number of at least three gate controlled semiconduc-

tor devices in series circuit relation and each said device having an anode, a cathode and a gating electrode, serially connected semiconductor devices in each said branch circuit having common anode-cathode terminals defining intermediate operating voltage levels in each said branch circuit, intermediate cross connections between common anode-cathode terminals at like intermediate voltage levels in each of said



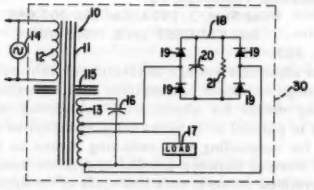
branch circuits, said terminal and intermediate cross connections defining a plurality of serially connected switch sections each including at least two oppositely poled semiconductor devices, and common gate pulse supply means connected to supply current pulses between the cathodes and gating electrodes of all said semiconductor devices once during each half cycle of alternating voltage impressed between said switch terminals.

3,938,033

FERRORESONANT TRANSFORMER REGULATOR

Henry S. Borkovitz, Skokie, and William E. Lucarz, Des Plaines, both of Ill., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed May 22, 1974, Ser. No. 472,182
Int. Cl.² G05F 3/06; 323/60, 61
U.S. Cl. 323—60 **6 Claims**



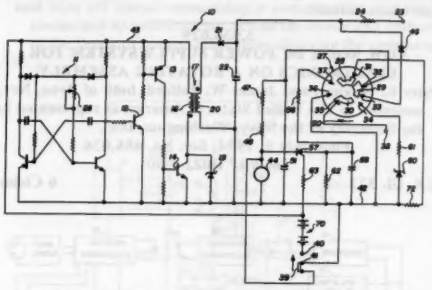
1. In an alternating current regulator system resistant to the effects of transients such as occur at start-up, a source of alternating current energy, a high leakage reactance transformer, a primary winding therewith for connection to said source, secondary winding means having means for connection to a load, a magnetic shunt interposed between said primary winding and said secondary winding means, a first capacitor connected in shunt with said secondary winding means, means for minimizing the effects of transients such as occur during start-up comprising rectifier means connected to a portion of said secondary winding means, a second capacitor connected in shunt with the direct current output of said rectifier means and a resistor connected in shunt with said second capacitor, whereby the effects of voltage variation on said load due to transients is minimized.

3,938,034

GAS TUBE TESTER

Ronald J. Japenga, Glendale Heights, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.

Filed May 6, 1974, Ser. No. 467,066
Int. Cl.² G01R 31/24
U.S. Cl. 324—20 R **12 Claims**



1. A gas tube tester comprising in combination: terminal means for connection to the external terminals of a cold cathode gas discharge tube to be tested, a first circuit arrangement selectively connected to said terminal means for applying a progressively increasing voltage to said terminal means, said progressively increasing voltage ultimately reaching a breakover voltage of the gas tube being tested, first detector means for sensing said breakover voltage, indicating means connected to said first detector means for indicating said breakover voltage, a second circuit arrangement selectively connected to said terminal means for applying a fixed voltage of predetermined value to establish a static leakage current through the gas discharge tube being tested, and a second detector means for sensing said static leakage current flowing through said gas tube being tested, said detector means including switching means for producing a discharge current therethrough when the static leakage current through said gas tube being tested exceeds a predetermined minimum value.

3,938,035

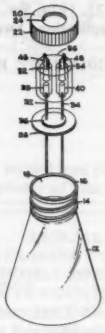
ELECTRICAL CONDUCTIVITY CELL AND METHOD FOR FABRICATING THE SAME

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of William P. Gilbreath, San Jose, Calif.; Michael J. Adamson, San Jose, Calif., and Alexander G. Fassbender, San Jose, Calif.

Filed July 16, 1974, Ser. No. 489,009
Int. Cl.² G01N 27/07
U.S. Cl. 324—30 B **5 Claims**

1. A test cell for testing the electrical characteristics of a sample comprising an impervious container for the sample, said container having an opening and a shoulder circumscribing said opening, a laminated disc having an area corresponding to that of the opening, said disc having an inner lamina and an outer lamina, said inner lamina being inert to the sample and sealable on said shoulder, said outer lamina being formed of self sealing material fixed to said inner lamina, means for retaining said disc in spanning relation of said opening, said retaining means acting to seal the periphery of said inner lamina against said shoulder and to expose a medial region of said outer lamina exterior of said container, first and second electrodes transpiercing said disc at a portion of the medial region thereof, and means for supporting said electrodes in gas tight relation to said disc, said supporting means being limited so as to afford access to a portion of the medial region of said disc so that the medial region can be pierced to afford introduction of the sample into said container, wherein said supporting means comprises first and second cylindric members having central bores of a diameter larger than the outer diameter of said electrodes, said cylindric members being disposed

on respective said electrodes so that the outer ends of the electrodes extend through said bores, said cylindric members



having axial extremities secured to said outer lamina, and means intermediate the surface of said electrodes and said bores for forming a gas tight seal therebetween.

3,938,036

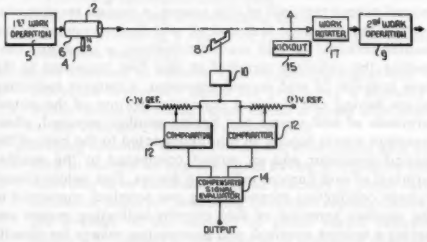
METHOD OF ASCERTAINING AND CORRECTING WORKPIECE TURNING

Erik Hansen, Otterup, Denmark, assignor to A/S Haustrups Fabriker, Odense, Denmark

Continuation of Ser. No. 51,909, July 2, 1970, abandoned. This application May 5, 1972, Ser. No. 250,618

Int. Cl.² G01R *33/00*

U.S. Cl. 324—34 R **6 Claims**



1. Method for ascertaining whether a ferromagnetic cylindrical workpiece having an axis and being conveyed generally axially along a path of travel from a first work operation to a subsequent work operation has rotated about its axis away from the position assumed in the first work operation comprising the steps of in connection with the first work operation applying an axial magnetic track on the workpiece with a certain rotational placement about the workpiece axis in relation to a selected site where the first work operation is performed on the workpiece, and in combination with the subsequent work operation detecting the magnetic track on the workpiece by magnetism detecting means that have the same rotational placement with respect to the workpiece axis relative to the selected site of the first work site.

3,938,037

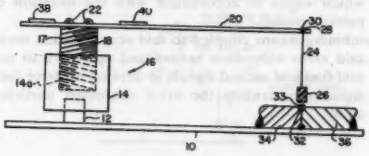
DEVICE FOR MEASURING THE FERRITE CONTENT IN AN AUSTENITIC STAINLESS STEEL WELD MATERIAL

Wayman N. Clotfelter, and Benjamin F. Bankston, both of Huntsville, Ala., assignors to The United States of America as represented by the United States National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 29, 1974, Ser. No. 518,546

Int. Cl.² G01R *33/12*

U.S. Cl. 324—34 R **5 Claims**



1. A device for measuring the ferrite content in an austenitic stainless steel weld material comprising:

a. a base plate;

b. a support member;

c. means mounted adjacent one end of said base plate for adjustably positioning said support member in a vertical direction;

d. a cantilever beam mounted on said support member;

e. a permanent magnet suspended from the free end of said cantilever beam;

f. strain gauge means mounted on said cantilever beam for measuring the amount of deflection of said beam;

g. instrumentation means connected with said strain gauge means for converting the amount of deflection of said beam into a signal indicating the ferrite content of a specimen of austenitic weld material;

whereby said magnet is lowered by adjusting said support member downwardly until said magnet magnetically grabs said specimen of weld material whereupon said magnet is raised by adjusting said support member upwardly until the force of attraction is overcome at which time the deflection of the beam is measured by said strain gauge means to indicate the content of ferrite present in the weld material specimen.

3,938,038

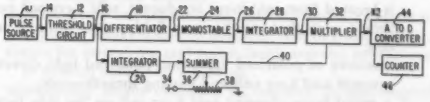
METHOD AND APPARATUS FOR PROVIDING PRIMARY COINCIDENCE CORRECTION DURING PARTICLE ANALYSIS

Stephen K. Campbell, Hialeah, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed July 1, 1974, Ser. No. 484,580

Int. Cl.² H03K *21/30*; G06M *11/00*

U.S. Cl. 324—71 CP **21 Claims**



1. A method for automatically correcting a particle pulse count subject to coincidence error wherein particle pulses are developed in response to passage of particles in a particulate system through a sensing zone, including the steps of:

developing a first signal which varies in accordance with the number of particle pulses,

developing a second signal which varies in accordance with the duration of the particle pulses,

combining said first and second signals to develop an error corrected signal representing the error corrected particle pulse count.

10. An apparatus for automatically correcting a particle pulse count subject to coincidence error wherein particle pulses are developed in response to passage of particles in a particulate system through a particle sensing device, said apparatus including in combination,

accumulation means operative in response to said particle pulses to develop a first signal which varies in accordance with the number of particle pulses,

error correction means operative in response to the duration of said particle pulses to develop a second signal which varies in accordance with the duration of said particle pulses,

combining means coupled to said accumulation means and said error correction means and operative to combine said first and second signals to develop an error corrected signal representing the error corrected particle pulse count.

3,938,039
VOLTAGE MEASURING DEVICE FOR ENCAPSULATED HIGH-VOLTAGE INSTALLATIONS

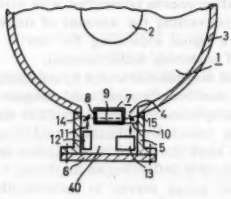
Wolfgang Hermstein, Nurnberg; Gerhard Rosenberger, and Willi Müller, both of Berlin, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 8, 1974, Ser. No. 495,839

Claims priority, application Germany, Aug. 10, 1973, 2341074

Int. Cl.² G01R 31/00

U.S. Cl. 324—96 **11 Claims**



1. A voltage measuring device for use with an encapsulated, high-voltage switching installation including an inner conductor within a grounded metallic outer tube wherein an electric field exists between said inner conductor and said outer tube which comprises:

a. means for widening said outer tube to thereby form a space for locating at least one of the following elements of said measuring device;

b. a Kerr cell positioned, approximately, at a distance from said inner conductor equal to the distance said outer tube is located from said inner conductor, said Kerr cell positioned such that said electric field passes through said cell;

c. a source of polarized light, said polarized light directed towards said Kerr cell and passing therethrough;

d. a metal layer covering said Kerr cell on the side facing away from said inner conductor, said metal layer electrically connected to said outer tube; and

e. an optical evaluation device for monitoring the polarized light exiting from said instrument, said evaluation device producing an indication proportional to the amount of shift of the plane of polarization of said light, the amount of said shifting being proportional to the intensity of said electric field.

3,938,040
APPARATUS FOR MEASURING A SIGNAL VOLTAGE INCLUDING A CURRENT SOURCE WITH A CONTROL INPUT ON WHICH SAID SIGNAL APPEARS

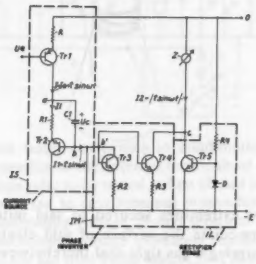
Bengt Gustav Lofmark, Skarholmen, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 22, 1974, Ser. No. 453,563

Claims priority, application Sweden, Apr. 17, 1973, 73054124

Int. Cl.² G01R 19/22; H02M 7/00

U.S. Cl. 324—119 **3 Claims**



1. An apparatus for measuring the voltage of a signal which is substantially sinusoidal comprising a source of operating voltage having first and second output terminals, first and second transistors each having emitter, collector and base terminals, a first resistor connecting the emitter terminal of said first transistor to the first output terminal of said source, the base terminal of said first transistor being adapted to receive signals to be measured, means for connecting the collector terminal of said second transistor directly to the second output terminal of said source, a second resistor connecting the collector terminal of said first transistor to the emitter terminal of said second transistor, a capacitor connecting the collector terminal of said first transistor to the base terminal of said second transistor, a current indicating means having one terminal connected to one of the output terminals of said source and having another terminal, phase inversion means having an input connected to the base of the second transistor and an output connected to the another terminal of said current indicating means, first unidirectional current conducting means having one terminal connected to the another terminal of said current indicating means and having a second terminal, and nonreactive means for directly connecting the second terminal of said first unidirectional current conducting means to the base terminal of said second transistor.

3,938,041
TAPE PACK DIAMETER MEASUREMENT MEANS AND METHOD

Kenneth Louth, Menlo Park, and Reginald William Oldershaw, San Jose, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

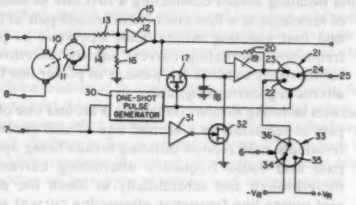
Filed June 21, 1973, Ser. No. 371,975

Int. Cl.² G01R 17/00; B65H 59/38

U.S. Cl. 324—158 R **11 Claims**

1. A method of measuring the tape pack diameter of a reel of tape driven by a reel servomotor, comprising:

measuring the inertia of a first tape pack, and comparing said inertia with an inertia value representative



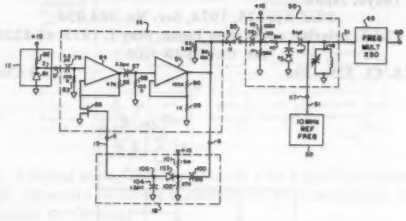
of the inertia of a second tape pack of known diameter to determine the diameter of said first tape pack.

3,938,042

MEASUREMENT AVERAGING COUNTING APPARATUS EMPLOYING A RANDOMLY PHASE MODULATED TIME BASE TO IMPROVE COUNTING RESOLUTION

John H. Gliever, San Jose, and David C. Chu, Woodside, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 437,460, Jan. 28, 1974, Pat. No. 3,886,451. This application Aug. 12, 1974, Ser. No. 496,510
Int. Cl.² G04F 11/06
U.S. Cl. 324—186 **12 Claims**



1. Measuring apparatus comprising:
means for producing a modulating signal;
means for producing a reference frequency signal having a reference frequency;
means coupled to receive the modulating signal and the reference frequency signal for producing a plurality of phase varied reference pulses varied in phase with respect to the reference frequency signal; and
averaging counting means having a synchronized gate coupled to receive an applied signal having a repetitive characteristic to be measured and the plurality of phase varied reference pulse for producing an output representative of the average of the number of phase varied reference pulses with respect to the number of repetitive characteristics occurring during a measurement.

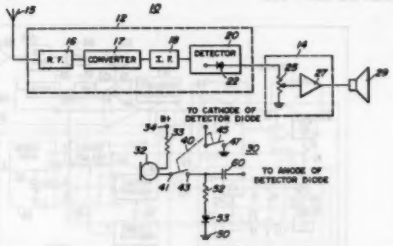
3,938,043

PUBLIC ADDRESS/RADIO SWITCHING SYSTEM

Samir Thakorbhai Desai, Roselle, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Feb. 10, 1975, Ser. No. 548,323
Int. Cl.² H04B 1/40
U.S. Cl. 325—18 **14 Claims**

1. In combination with a radio receiver having a tuner and an audio amplifier coupled thereto
a signal source means including an electrical gain stage, the gain stage biased to conduct a quiescent current, the signal source means optimally operable with a fixed load,
a switching means operable in a first or a second state, the switching means operable in the second state to couple the source means to the audio amplifier and operable in the first state to decouple the source means from the audio amplifier,
a load means including a semiconductor device series connected to a load element selected to optimally operate the signal source means, the device having a pair of electrodes and an internal resistance therebetween, the resistance relatively low in response to a common current flowing from the first to the second electrode, the resistance otherwise relatively high,
means coupling the source means quiescent current to the load means device in response to the switching means assuming a second state.

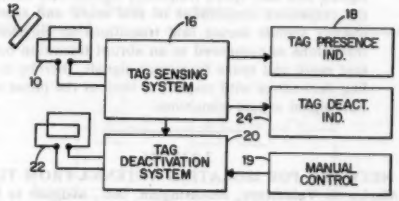


3,938,044

ANTENNA APPARATUS FOR AN ELECTRONIC SECURITY SYSTEM

George Jay Lichtblau, 425 E. 63rd St., New York, N.Y. 10021

Filed Nov. 14, 1973, Ser. No. 415,657
Int. Cl.² H04B 1/48
U.S. Cl. 325—22 **28 Claims**

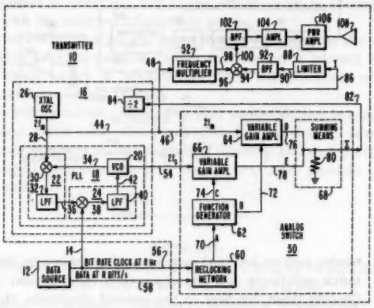


19. An antenna system comprising:
a receiving loop antenna operative to provide to utilization means an output indication of the presence of a resonant tag circuit;
a transmitting loop antenna;
said receiving and transmitting antennas being disposed in coplanar adjacent spaced balanced coupling relationship;
means for energizing said transmitting antenna in response to manual actuation, including:
transmitting means operative in response to said manual actuation;
coupling means operative to supply energizing signals from said transmitting means to said transmitting antenna in response to said manual actuation; and
switching means operative in response to said manual actuation to isolate said receiving antenna from said utilization means upon energization of said transmitting antenna, thereby to prevent damage to said utilization means during operation of said transmitting antenna.

3,938,045
TRANSMITTER FOR FREQUENCY SHIFT KEYED MODULATION

Howard Robert Mathwich, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 3, 1974, Ser. No. 485,519
Int. Cl.² H04L 27/12
U.S. Cl. 325—163 8 Claims



1. A transmitter for communicating binary data by frequency shift keying (FSK), wherein the FSK signal comprises bits of mark frequency signals and space frequency signals in accordance with said binary data, said mark frequency and said space frequency being respectively indicative of predetermined values in said data, comprising:

means for generating said mark and space frequency signals;

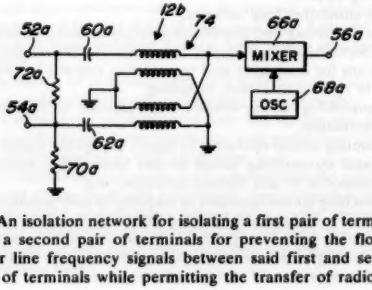
analog switching means, receptive of said mark and space frequency signals and said binary data, for generating said FSK signal;

said analog switching means effecting, in accordance with said binary data, transitions between said mark frequency signals and said space frequency signals and controlling the respective amplitudes of said mark and space frequency signals during said transitions to lengthen said transitions as compared to an abrupt transition between said mark and space frequency signals, thereby controlling derivatives with respect to time of the phase of said FSK signal at said transitions.

3,938,046
NETWORK FOR ISOLATING ANTENNA FROM TUNER

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed Oct. 21, 1974, Ser. No. 516,185
Int. Cl.² H04B 1/18
U.S. Cl. 325—362 18 Claims



1. An isolation network for isolating a first pair of terminals from a second pair of terminals for preventing the flow of power line frequency signals between said first and second pairs of terminals while permitting the transfer of radio frequency signals between said first and second terminals comprising:

first isolating means connecting a first one of said first pair of terminals to a first one of said second pair of terminals, said first isolating means being operative to pass radio frequency alternating current signals therethrough and substantially to block the passage of power line frequency alternating current signals;

second isolating means connecting a second one of said first pair of terminals to a second one of said second pair of terminals, said second isolating means being operative to pass said radio frequency alternating current signals therethrough and substantially to block the passage of said power line frequency alternating current signals;

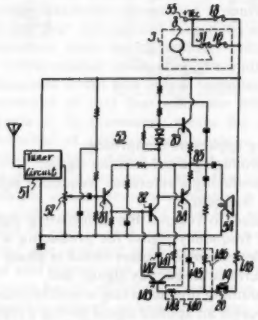
direct current conductive means connected between the first terminals of each of said first and second terminal pairs for providing a direct current conductive path therebetween for discharging said first isolating means; and

second direct current conductive means connected between the first and second terminals of said first pair of terminals to provide a direct current conductive path therebetween for discharging said second isolating means through said second direct current conductive means and at least a portion of said first direct current conductive means.

3,938,047
CONTROL CIRCUIT FOR USE WITH AMPLIFIER

Taiwa Okanobu, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1974, Ser. No. 464,034
Claims priority, application Japan, May 1, 1973, 48-52286
Int. Cl.² H04B 1/06
U.S. Cl. 325—396 4 Claims



1. A control circuit for use with an amplifier comprising: a signal source for producing a signal; an amplifier circuit consisting of an input transistor which receives said signal from said signal source on its control electrode, a driving transistor with its control electrode connected to an output electrode of said input transistor, and a power amplifying transistor with its control electrode connected to an output electrode of said driving transistor;

an output means connected to the output electrode of said power amplifying transistor;

a switching transistor with its output electrode connected to the control electrode of said driving transistor;

a negative feedback circuit connected between the output electrode of said power amplifying transistor and an input electrode of said switching transistor, said negative feedback circuit including a capacitor and a resistor connected in parallel with each other;

a voltage source for applying a voltage to said amplifier circuit;

a charging and discharging circuit connected between ground and the control electrode of said switching transistor, and

a momentary switch means connected between said voltage source and said charging and discharging circuit such that when said switch is means momentarily closed said charging and discharging circuit charges which causes said switching transistor to conduct and supply negative feedback to said driving transistor to turn it off and when said switch opens after closing said charging and discharging circuit discharges for a period of time after which said switching transistor is turned off which turns said driving transistor on to supply power to said output means.

3,938,048

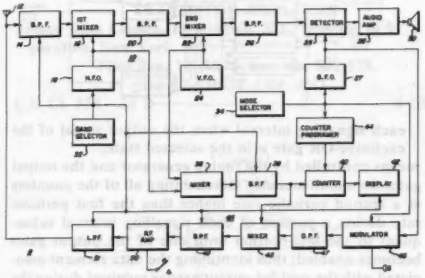
FREQUENCY MEASURING APPARATUS

Michael F. Elliott, St. Joseph, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed Oct. 10, 1974, Ser. No. 513,851

Int. Cl.² H04B *1/16*

U.S. Cl. 325—455 **8 Claims**



1. A digital tuning indicator for use with a multi-conversion radio apparatus including a plurality of local oscillators, said indicator comprising:

mixing means coupled to each of said local oscillators and forming a premix signal having a frequency responsive to the frequencies of operation of said local oscillators;

counting means coupled to the output of said mixing means and forming a count responsive to the number of cycles of said premix signal occurring over a period of predetermined length;

display means coupled to said counting means for displaying the count achieved by said counting means at the end of said period; and

programming means coupled to said counting means for altering the count attained on said counting means by an amount related to an intermediate frequency of said radio apparatus.

3,938,049

BASELINE CORRECTION SYSTEM FOR PULSE TRAINS

Jesse L. Acker, Rockaway, N.J., and Peter M. Meserol, E. Northport, N.Y., assignors to Akro-Medic Engineering, Inc., Denville, N.J.

Division of Ser. No. 290,654, Sept. 20, 1972, Pat. No. 3,837,745. This application Aug. 23, 1974, Ser. No. 500,124

Int. Cl.² H03B *1/00*; H03K *5/00*; H04B *1/10*

U.S. Cl. 328—162 **6 Claims**

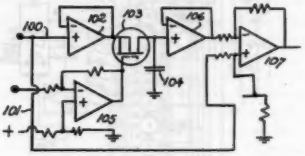
1. In combination:

a. a source generating a train of pulses separated by intervals of varying baseline levels;

b. signal generator means for generating an output signal for each successive pair of said pulses, said output signal being of time extent equal to the interval separating such pulse pair;

c. switch means having an input terminal for receiving said train of pulses, a control terminal for receiving such output signals and an output terminal, said switch means being rendered conductive throughout occurrence of said output signals;

d. signal storage means connected to said switch means output terminal for storing signals conducted through said switch means; and



e. differential amplifier means having a first input terminal for receiving said signals stored in said storage means, a second input terminal for receiving said train of pulses and an output terminal providing signals indicative of the level difference between said pulse train and said stored signals.

3,938,050

NON-LINEAR CORRECTION OF WAVEFORMS

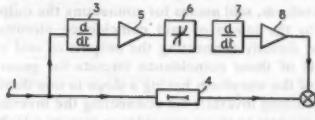
John McCreath Corbett, Harrow, and Josef Maria Linke, Watford, both of England, assignors to The Post Office, London, England

Filed Sept. 9, 1974, Ser. No. 504,157

Claims priority, application United Kingdom, Sept. 25, 1973, 44888/73

Int. Cl.² H03B *1/04*; H04B *1/10*, *15/00*

U.S. Cl. 328—163 **14 Claims**



1. A waveform correction circuit comprising:

an input terminal for receipt of a signal to be corrected, an output terminal from which, in use, a corrected signal is taken,

a time-delay circuit having its input connected to the input terminal,

a differentiator having its input connected to the input terminal,

a circuit whose input/output characteristic is non-linear and skew-symmetrical having its input connected to the output of the differentiator,

a further differentiator having its input connected to the output of the non-linear skew-symmetric circuit,

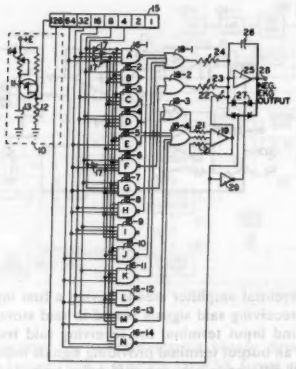
a signal combining circuit operative to combine the output of the further differentiator and the output of the delay circuit, and

means connecting the output of the signal combining circuit to the output terminal.

3,938,051
DIGITAL ELECTROCARDIOGRAM WAVEFORM GENERATOR

Robert M. Eisenberg, Derwood, Md., assignor to The Singer Company, New York, N.Y.

Filed Oct. 1, 1974, Ser. No. 511,052
Int. Cl.² H03K 4/00
U.S. Cl. 328—187 8 Claims



1. A waveform generator for generating a non-symmetrical recurrent waveform, said generator comprising a source of clock signals, a counter, means for connecting the output from said source to the count input of said counter, said counter having a plurality of outputs which are energized in a prescribed sequence as said counter counts clock signals from said source, a plurality of coincidence circuits, means for connecting the individual outputs from said counter to the inputs of said coincidence circuits so that individual coincidence circuits are rendered conductive at prescribed times and for prescribed intervals to generate individual potentials each of which represents a unique slope of the waveform at a prescribed time, means connected to the outputs of said coincidence circuits for receiving the signal outputs of said coincidence circuits and forming them into a continuous multisloped waveform, said means for connecting the outputs of the counter to the inputs of said coincidence circuits includes means for directly connecting the outputs of said counter to the inputs of those coincidence circuits for generating the portions of the waveform having a slope in one direction, and means including inverters for connecting the inverted outputs from the counter to those coincidence circuits which generate the portions of the waveform having a slope of opposite polarity to said one direction.

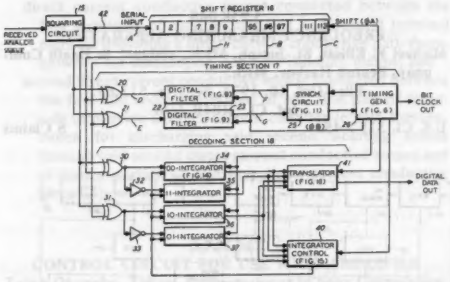
3,938,052
DIGITAL DEMODULATOR FOR PHASE-MODULATED WAVEFORMS

Jerry M. Glasson, Skokie, and Ira S. King, Chicago, both of Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed May 9, 1974, Ser. No. 468,325
Int. Cl.² H04L 27/22
U.S. Cl. 329—104 7 Claims

1. A demodulator for a received wave having phase shifts between successive signalling intervals the phase shifts encoding data elements, which includes: a timing generator, means for synchronizing the timing generator with the received wave, means for generating a squared version of the received wave, a shift register for storing periodic samples of the squared wave for a period encompassing a current signalling interval and at least a portion of a previous signalling interval, a plurality of exclusive-OR gates connected to stages of the shift register for comparing selected pairs of samples from the shift register; and means controlled by the exclusive-OR gates and the timing generator for identifying which data element is received during each signalling interval, wherein the identifying means comprises:

a. for each data element:
   i. a counter,
   ii. an output gate connected to the counter for sensing when the counter reaches a particular count,
   iii. means controlled by the timing generator and the exclusive-OR gate whose selected output state is associated with the data element for incrementing the counter at a first periodic rate during a mid-portion of each signalling interval when the output signal of the exclusive-OR gate is in the selected state;



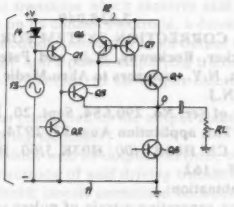
b. means controlled by the timing generator and the output gates for simultaneously incrementing all of the counters at a second periodic rate higher than the first periodic rate during a portion of each signalling interval subsequent to the mid-portion until one of the output gates becomes enabled, thus identifying the data element associated with the enabled output gate as received during the signalling interval; and

c. means controlled by the timing generator for resetting the counters subsequent to one of the output gates becoming enabled and before the mid-portion of the next signalling interval.

3,938,053
INTEGRATED CIRCUIT FOR CLASS-B POWER AMPLIFIER

Pietro Menniti, and Bruno Murari, both of Milan, Italy, assignors to SGS-ATES Componenti Elettronici SpA, Milan, Italy

Filed Sept. 19, 1974, Ser. No. 507,464
Claims priority, application Italy, Sept. 20, 1973, 29148/73
Int. Cl.² H03F 3/187
U.S. Cl. 330—17 10 Claims



1. A power amplifier comprising:

a supply of direct current with a first bus bar and a second bus bar of opposite polarities;

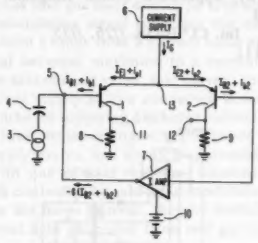
a source of signals to be amplified;
a control transistor of one conductivity type having a base, a collector and an emitter;
an output transistor of said one conductivity type having a base, a collector and an emitter, the emitter of said control transistor being tied to that of said output transistor;
an output impedance inserted between said first bus bar and the interconnected emitters of said control and output transistors;
input circuitry connecting said source between said first bus bar and the base of said control transistor;
a diode connected in forward direction between said second bus bar and the collector of said control transistor;
an ancillary transistor of opposite conductivity type having an emitter connected to said second bus bar, a base connected to the collector of said control transistor, and a collector connected to the base of said output transistor for delivering to said output transistor a driving current substantially replicating the collector current of said control transistor; and
a load circuit connected across said output impedance.

3,938,054

TRANSISTOR AMPLIFIER

Arthur John Leidich, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 16, 1975, Ser. No. 541,518
Int. Cl.² H03F *3/04*, *3/45*
U.S. Cl. 330—30 D **4 Claims**



4. In combination:
two transistors of the same conductivity type, each having base and emitter and collector electrodes, their respective emitter electrodes connected to one terminal for a current supply and individually coupled at their collector electrodes to the other terminal for said current supply, said transistors operating at substantially the same temperature and having substantially the same current gain;
a signal input terminal at the base electrode of said first transistor;
a signal output terminal at the collector electrode of one of said transistors; and
a feedback path comprising a current amplifier directly connected at its input terminal to the base electrode of said second transistor and at its output terminal to the base electrode of said first transistor, said amplifier exhibiting inverting current gain.

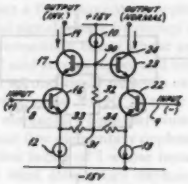
3,938,055

HIGH PERFORMANCE DIFFERENTIAL AMPLIFIER

Frederick T. Buhler, Newark, Calif., assignor to Aeronutronic Ford Corporation (formerly Philco-Ford Corporation), Blue Bell, Pa.

Filed Jan. 17, 1975, Ser. No. 541,937
Int. Cl.² H03F *3/68*
U.S. Cl. 330—30 D **5 Claims**

1. A differential amplifier comprising an input pair of transistors connected as base driven common emitter amplifiers, said input pair having the emitter of each element connected to a separate one of a first pair of constant current sources, said first pair of sources having equal current characteristics,
an output pair of transistors connected as common base transistors emitter driven from the collectors of said input pair, the base electrodes of said output pair being connected together and supplied from a constant current



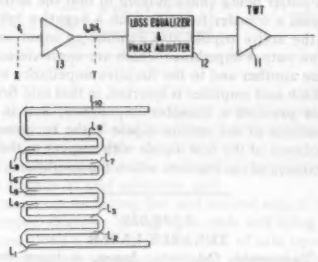
source independent from said first pair of constant current sources,
a matched pair of resistors elements series connected between the emitter electrodes of said input pair, and
a resistor connected between the juncture of said matched pair of resistors and the base electrodes of said output pair.

3,938,056

METHOD AND APPARATUS FOR ENHANCING THE OUTPUT FROM A TRAVELING WAVE TUBE

Norman H. Pond, Los Altos, Calif., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed Jan. 18, 1971, Ser. No. 107,404
Int. Cl.² H03F *3/58*
U.S. Cl. 330—43 **4 Claims**



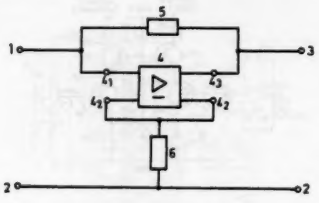
1. A microwave amplification circuit comprising:
a first microwave amplifying means of at least an octave bandwidth having an input and an output,
a second microwave amplifying means of at least
an octave bandwidth having an input connected to receive and amplify signals from the output of said first amplifier,
both of said amplifying means constructed to amplify a fundamental microwave signal and producing a second harmonic signal of such fundamental signal during amplification of said fundamental signal, and
a dispersive delay line connected in circuit between the output of said first amplifying means and the input of said second amplifying means,
said delay line constructed to shift the phase between a fundamental signal and a second harmonic of such fundamental signal from the output of said first amplifying means at the input of said second amplifying means by less than one cycle for optimum suppression at frequencies within at least plus or minus 20 percent of the upper frequency of the octave.

3,938,057

TELECOMMUNICATIONS SIGNAL AMPLIFIER

Pierre Jean Marie Minot, Ivry-sur-Seine, France, assignor to Societe Anonyme de Telecommunications, Paris, France

Filed Mar. 26, 1973, Ser. No. 345,010
Claims priority, application France, Aug. 4, 1972, 72.28336
Int. Cl.² H03F 1/34
U.S. Cl. 330—78 1 Claim



1. A telecommunications signal amplifier presenting an input terminal, an output terminal, and a common input and output terminal and being composed:

of an active tripole provided with an input terminal,

an output terminal and a common input and output terminal and

a first passive dipole including two terminals, one of which is connected to the common input and output terminal of the tripole, and the other of which is connected to the common input and output terminal of the amplifier; and

a second passive dipole including two terminals, one of which is connected to said input terminal of said amplifier and said input terminal of said active tripole and the other of which is connected to said output terminal of said amplifier and said output terminal of said active tripole;

said amplifier being characterized in that the active tripole presents a transfer function with a negative real portion and the active tripole also exhibits an input impedance and an output impedance which are approximately equal to one another and to the iterative impedance of the line in which said amplifier is inserted, in that said first passive dipole presents a complex impedance, and in that the impedance of the second dipole is the reciprocal of the impedance of the first dipole with respect to the iterative impedance of the line into which the amplifier is inserted.

3,938,058

TUNABLE LASER

Manabu Yamamoto, Odawara, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 25, 1974, Ser. No. 454,710
Claims priority, application Japan, Mar. 26, 1973, 48-34270
Int. Cl.² H01S 3/082
U.S. Cl. 331—94.5 C 7 Claims

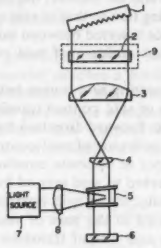
1. A tunable laser comprising:

an optical resonant cavity capable of supporting a plurality of optical wavelengths within only a selectable prescribed wave number range;

a laser active medium, disposed within said optical resonant cavity, for producing laser radiation;

pumping means for exciting said laser active medium, for producing laser radiation at said plurality of optical wavelengths; and

interference means, disposed within said optical resonant cavity in the path of said laser radiation, for permitting passage therethrough of only a pair of said laser wavelengths, the respective polarizations of which are different, said interference means including a pair of reflectors separated from each other by optically anisotropic material, the refractive index of said anisotropic material and the distance between said reflectors being such that the difference in the wave number between said pair of laser



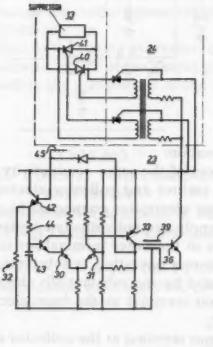
wavelengths is less than said prescribed wave number range.

3,938,059

SOLID STATE RECTIFIER CONTROL UNIT

Bernard Canning, Birmingham, England, assignor to Lodge-Cottrell Limited, Birmingham, England

Filed Aug. 21, 1974, Ser. No. 499,367
Claims priority, application United Kingdom, Aug. 23, 1973, 39956/73
Int. Cl.² H03K 3/26, 3/35
U.S. Cl. 331—111 3 Claims



1. A rectifier control circuit comprising a transformer having a primary winding and a secondary winding, a thyristor having anode and gate electrodes connected to the secondary winding and an oscillator coupled with the transformer primary winding, the oscillator comprising a pair of parallel connected alternately conducting transistors, a switching transistor connected with and controlling the energization of the primary winding, the conductive state of the switching transistor being controlled by one of said transistors, and a capacitor timing circuit controlling the conduction of the other of said transistors, the timing circuit comprising a capacitor connected in series with a charging transistor and in parallel with a discharge circuit, the base of said charging transistor being connected to said switching transistor whereby the conductive state of the switching transistor determines the conductive state of the charging transistor.

3,938,060
DEVICE FOR MODULATING INTENSITY OF LIGHT RAYS GENERATED FROM GAS LASER

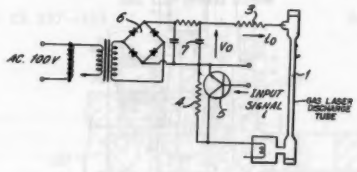
Masahiko Kato, No. 37-3, Shimoyotsugi, Akita, Nishitama, Tokyo; Asao Hayashi, No. 914, Komiya-cho, Hachioji, Tokyo, and Takeomi Suzuki, No. 182, Higashiolzumi, Nerima, Tokyo, all of Japan

Continuation of Ser. No. 289,218, Sept. 15, 1972, abandoned. This application Dec. 11, 1974, Ser. No. 531,820

Claims priority, application Japan, Dec. 27, 1971, 46-105399

Int. Cl.² H01S 3/09; H05B 37/00

U.S. Cl. 332—7.51 **10 Claims**



1. A device for rapidly modulating at frequencies up to 200 KH, the intensity of light rays generated by a gas laser for picture image transmission, said device comprising an He-Ne gas laser discharge tube connected across the secondary side of a transformer, the pressure of gas sealed being of the order of 3 to 4.3 torr, and a modulating current supply source connected across said gas laser discharge tube and controlled by an input modulating signal such that the discharge current changes within a range from a current value at which the laser light output becomes maximum to a current value which is larger than said current value, said current source including a direct current supply source connected across said gas laser discharge tube for supplying discharge current to said gas laser discharge tube, resistors connected in series with said direct current supply source, and a switching transistor connected in parallel with one of said resistors, whereby said switching transistor is controlled by said input modulating signal so as to control the discharge current, thereby modulating the intensity of output light generated from said gas laser.

3,938,061
FREQUENCY SUMMING DEVICE

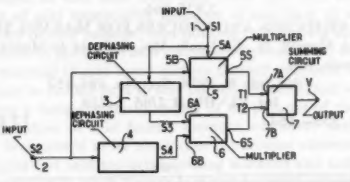
Georges Levasseur, Goussainville, and Michel Garconnat, Ris Orangis, both of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Filed Dec. 20, 1973, Ser. No. 426,576

Claims priority, application France, Dec. 20, 1972, 72.45392

Int. Cl.² H03C 1/52

U.S. Cl. 332—45 **10 Claims**



1. Device for summing two first and second sinusoidal signals of frequency F and *f*, respectively, comprising a first dephasing circuit receiving said first signal and providing a third signal whose frequency is F dephased 90° in relation to the said first signal, a second dephasing circuit receiving said second signal and providing a fourth signal whose frequency is *f* dephased by 90° in relation to said second signal, a first and a second analog multiplier each comprising two inputs, said first multiplier receiving on one of its inputs a signal whose frequency is F and a signal whose frequency is f taken from the group of signals constituted by said first, second, third and fourth signals, said second multiplier receiving at its inputs, the two remaining signals of said group, and an adder having inputs connected to the outputs of said two multipliers, characterized in that the frequency f varies in a frequency band centered on the frequency fo and in that said second dephasing circuit comprises a first elementary dephaser receiving on its input said second signal whose frequency is f and providing at its output an intermediate signal whose amplitude is equal to the amplitude of said second signal and whose dephasing in relation to the said second signal depends on the frequency *f*, that dephasing being equal to 90° for the frequency *fo*, a second and a third elementary dephaser connected in series to the output of the said first elementary dephaser, an attenuator having an attenuation factor of 3 whose input is connected to the output of said third elementary dephaser, and an adder having two inputs connected to the output of the said first elementary dephaser and of said attenuator, respectively, and whose output provides said fourth signal.

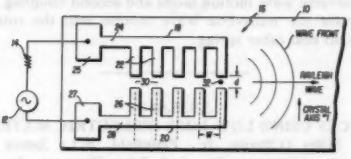
3,938,062
END FIRE SURFACE WAVE PIEZOELECTRIC TRANSDUCER

Theodore H. Hopp, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 10, 1975, Ser. No. 567,048

Int. Cl.² H03H 9/02, 9/20, 9/26; H01L 41/10

U.S. Cl. 333—30 R **11 Claims**



1. An acoustic surface wave device, which comprises:

a substrate of a material capable of propagating acoustic surface wave energy;

at least one electro-acoustic transducer coupled to a region of a surface of said substrate; and

said transducer including first and second sets of elongated electrode elements having open ends and being regularly spaced along a first direction, each of said open ends of said first set of elongated electrode elements substantially facing one of said open ends of said second set of elongated electrode elements and being separated therefrom along a second direction which is substantially perpendicular to said first direction, the other ends of said first set of elongated electrode elements all being connected to a first common bus, the other ends of said second set of elongated electrode elements all being connected to a second common bus.

3,938,063
CASCADE COUPLED COILED SPRING REVERBERATION MEANS

Herbert E. Meinema, 2231 Holly Ave., Escondido, Calif. 92027

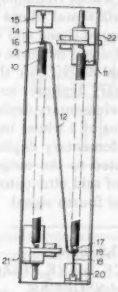
Filed Feb. 27, 1975, Ser. No. 553,830

Int. Cl.² H03H 9/30; H10H 1/02

U.S. Cl. 333—30 R **10 Claims**

1. An artificial reverberation line comprising in combination, at least two coil springs coupled into said line in cascade from a first spring to a terminal spring, transducer means for introducing acoustic energy into the first spring in a rotational

mode, transducer means for deriving acoustic energy in the rotational mode from the terminal spring, and transverse wave motion transmission means coupled between a selected two of said springs in said line with first coupling means to convert



said rotational mode energy from one spring and transmit it in the transverse wave motion mode and second coupling means to transfer the transverse wave motion into the rotational mode into said other spring.

3,938,064

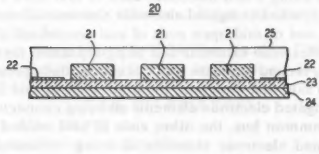
DEVICES USING LOW LOSS DIELECTRIC MATERIAL

Henry Miles O'Bryan, Jr., Plainfield, N.J.; James Kevin Pluorde, Allentown, Pa., and John Thomson, Jr., Wall Township, Monmouth County, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 394,187, Sept. 4, 1973, abandoned. This application July 1, 1974, Ser. No. 484,559

Int. Cl.² H01P *3/08, 7/06, 5/12;* **H01B** *3/10*

U.S. Cl. 333—73 S **10 Claims**



1. An apparatus for processing microwave electrical energy comprising a dielectric material for interaction with the microwave electrical energy a means for introducing microwave electrical energy to the dielectric material and a conducting member to contain the microwave electrical energy in the apparatus characterized in that the dielectric material consists essentially of a composition made up of ingredients that yields 18.0 – 19.0 mole percent divalent metal oxide remainder tetravalent metal oxide in which of the total amount of divalent metal oxide 0 – 0.4 mole percent is a metal oxide other than BaO, remainder BaO and of the total amount of tetravalent metal oxide 0 – 7 mole percent is metal oxide other than TiO_2, remainder TiO_2.

3,938,065

PUSH-BUTTON OPERATED BIPOLAR FAULTY CURRENT PROTECTIVE SWITCH

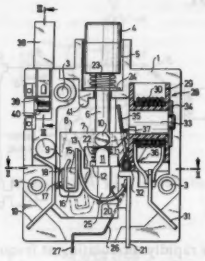
Jakob Ellenberger, Altendorf, near Nurnberg, Germany, assignor to Ellenberger & Poensgen GmbH, Altendorf, near Nurnberg, Germany

Filed July 12, 1974, Ser. No. 488,299

Claims priority, application Germany, July 31, 1973, 2338738

Int. Cl.² H01H *83/00*

U.S. Cl. 335—24 **6 Claims**



1. A push-button operated bipolar faulty current protective switch having two fixed contacts and two movable contacts, said fixed contacts co-operating with said movable contacts, and an electromagnetic tripping device which is actuated in dependence of a faulty current, such a circuit breaker comprising a switching bar, a bell crank made of electrically insulating material, a spring biased push-button, said push-button being rigidly connected to the switching bar, said bell crank including first and second leg members, said first leg member being arranged transversely of the switching bar so that it is freely pivotable thereon and displaceable axially thereof, said second leg member being arranged parallel to said switching bar, a cross member of an insulating material, said cross member having an abutment and being arranged on said second leg member and pivotally mounted about an axis substantially parallel to said switching bar and being provided at each of its ends with one of said movable contacts, said switching bar including a drive member, said drive member being adapted to engage said abutment on said second leg member in the switched off condition of said bell crank, a stop member, said stop member being adapted to maintain said bell crank at an angle to said switching bar in the switched off condition of said bell crank, so that it can be moved to the switched on condition, said electromagnetic tripping device including an armature provided with a protuberance, a spring, said protuberance being adapted to maintain said bell crank in its switched on condition against the bias of said spring.

3,938,066

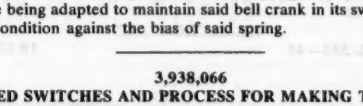
REED SWITCHES AND PROCESS FOR MAKING THEM

Vaughan Morrill, Jr., St. Louis, Mo., assignor to Morex, Inc., St. Louis, Mo.

Filed July 8, 1974, Ser. No. 486,452

Int. Cl.² H01H *1/66, 51/28*

U.S. Cl. 335—154 **12 Claims**



9. A reed switch comprising an envelope having a sealed, contact-containing section, and an elongated reed having, in succession, a lead section having an end-bearing portion, a sealing-bearing section, and a contact section having an end-

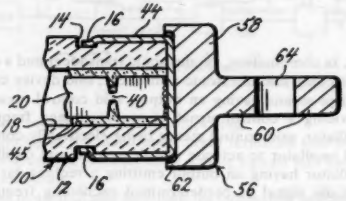
bearing portion, all within said envelope, said lead and contact-bearing portions bearing upon undistorted parts of the inside wall of said envelope, at least a part of said sealing-bearing portion being sealed in and to said envelope, and said lead section extending in a direction from said sealed-in part of said sealing-bearing portion away from said sealed, contact-containing section of said envelope.

3,938,067

PROTECTOR FOR ELECTRIC CIRCUITS

Aloysius J. Fister, Overland, Mo., assignor to McGraw-Edison Company, Elgin, Ill.

Filed June 28, 1974, Ser. No. 484,129
Int. Cl.² H01H 85/04
U.S. Cl. 337—159 **24 Claims**



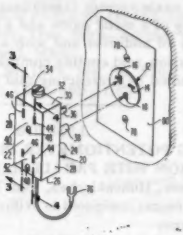
1. A current-limiting electric fuse that comprises a housing which has an elongated passage therein, terminals which are located at the ends of said passage, a fusible element which is disposed within said passage and which is electrically connected to said terminals, said fusible element being essentially composed of copper or silver and having at least one weak spot therein, said fusible element responding to a prolonged low but potentially-harmful overload or to a short circuit or heavy overload to "open", and arc-extinguishing material which directly contacts said weak spot and the inner surface of said passage and which substantially fills said passage, said weak spot having at least one portion thereof which is displaced from said inner surface of said passage but said one portion being displaced from said inner surface by a distance less than 64 millimeters, said weak spot having said one portion thereof displaced from each of said terminals a distance greater than eighty millimeters, said housing being made from an inorganic ceramic material which has a thermal conductivity greater than thirty thousandths of a calorie per square centimeter of cross section per centimeter of length per second of time per degree centigrade, said housing having the major portion of the outer surface thereof exposed to a cooling medium to enable said major portion of said outer surface to radiate heat to said cooling medium, said weak spot generating heat whenever current flows through said fusible element, said arc-extinguishing material absorbing appreciable amounts of said heat from said weak spot and transferring most of said appreciable amounts of said heat to said inner surface of said passage, said housing transferring appreciable amounts of the heat which it receives from said arc-extinguishing material to said outer surface thereof to enable said outer surface to radiate heat to said cooling medium, said weak spot having a temperature in excess of 80 percent of the melting temperature of said fusible element whenever said electric fuse is operated at its maximum continuous current carrying capacity but said arc-extinguishing material and said housing transferring so much heat to said outer surface of said housing that the temperature of said inner surface of said passage remains below 350°C., said thermal conductivity of said inorganic ceramic material of said housing limiting the temperature gradient between said inner surface of said passage and said outer surface of said housing to less than 200°C., the temperature of said weak spot rising to the melting temperature of said fusible element whenever said fusible element responds to a prolonged low but potentially-harmful overload to open but said arc-extinguishing material and said housing transferring so much heat to said outer surface of said housing that the temperature of said inner surface of said passage remains below 350°C.

3,938,068

ELECTRICAL PLUG AND OUTLET UNIT

Charles Hagan, 226 Lynn Road, Ridley Park, Pa. 19078

Filed Apr. 2, 1975, Ser. No. 564,312
Int. Cl.² H01H 85/46, 85/48
U.S. Cl. 337—189 **8 Claims**



1. An electrical plug and outlet unit adapted to be plugged into a high voltage, three-hole receptacle in which two of the holes are aligned with electrical contacts connected to hot lines for providing the high voltage current, and the other of said receptacle holes is aligned with a grounded electrical contact to provide an equipment ground; said unit comprising:

A. a non-conductive body member;

B. a single conductor prong and a single ground prong projecting rearwardly of the body member, said prongs being arranged in a pattern for permitting the conductor prong to be received within a receptacle hole aligned with an electrical contact connected to one of the high voltage hot lines, and for permitting the ground prong to be received within the receptacle hole aligned with the grounded electrical contact;

C. at least one outlet, each outlet including a pair of electrical contacts aligned with openings in a front face of said body member for permitting prongs of a conventional low voltage plug to be inserted through said openings into engagement with the electrical contacts aligned with said openings;

D. first electrical conductive means for connecting the conductor prong to one of said pair of electrical contacts of each outlet; and

E. second electrical conductive means for connecting the ground prong to the other of said pair of electrical contacts of each outlet, whereby one of the hot lines associated with the high voltage receptacle is excluded from the circuitry associated with each outlet of the plug and outlet unit.

3,938,069

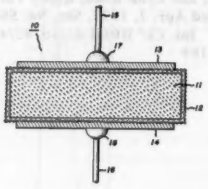
METAL OXIDE VARISTOR WITH PASSIVATING COATING

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Division of Ser. No. 401,334, Sept. 27, 1973, Pat. No. 3,857,174. This application Sept. 26, 1974, Ser. No. 509,337

Int. Cl.[2] H01C 7/12

U.S. Cl. 338—21 4 Claims



1. A metal oxide varistor comprising a body portion consisting essentially of a metal oxide and a relatively small amount of a plurality of additives and with a passivating coating on said body portion, said coating comprising a granular reaction product obtained by prereacting said additives.

3,938,070

TRIMMING POTENTIOMETER IN T OR PI NETWORK CONNECTION WITH PARALLEL RESISTANCE PATHS

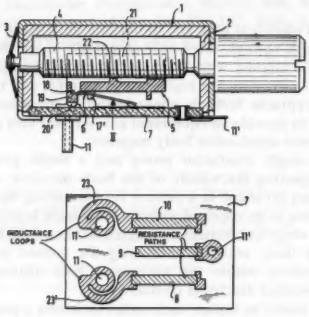
Georg Koerner, Hohenkirchen, and Tibor Hargita, Munich, both of Germany, assignors to Wilhelm Ruf KG, Hohenkirchen, Germany

Filed July 30, 1974, Ser. No. 493,079

Claims priority, application Germany, Aug. 25, 1973, 7331048[U]

Int. Cl.[2] H03H 7/26; H01C 10/16, 10/40, 1/12

U.S. Cl. 338—60 9 Claims



1. A trimming potentiometer comprising, in combination, an insulating plate; three parallel resistance paths in a plane on said insulating plate; terminals connected to said resistance paths; wiper contacts displaceable in the same direction on said resistance paths; carrier means attached to said wiper contacts for mounting said contacts; a threaded spindle connected to said carrier means for displacing said carrier means longitudinally; and inductance loop means between said resistance paths and said terminals for matching electrically the trimming potentiometer to its inductive and capacitive input and output values.

3,938,071

GENERATOR FOR CONTROLLING AN ULTRASONIC TRANSDUCER

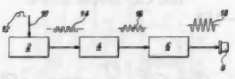
Roger Berger, Manosque; Claude Estienne, Marseille, and Jean Lapie, Volx, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 5, 1974, Ser. No. 476,576

Claims priority, application France, June 13, 1973, 73.21519

Int. Cl.[2] H04B 11/00

U.S. Cl. 340—15 5 Claims



1. In combination, an ultrasonic transducer and a device for controlling said ultrasonic transducer; said device comprising control means having an output, said control means output providing a control signal of predetermined frequency, an oscillator, said control means being electrically connected to said oscillator to activate and deactivate said oscillator, said oscillator having an output emitting a rectangular full-wave periodic signal of predetermined oscillating frequency and predetermined amplitude, said oscillator being constructed and arranged such that the duration of said periodic signal is dependent upon said activating and deactivating of said oscillator by said control signal and such that said oscillator only oscillates during the time period between said activating and deactivating, said control signal being synchronous with said periodic signal, said predetermined oscillating frequency of said oscillator periodic signal being wholly independent of said predetermined frequency of said control signal, filter means electrically connected to said oscillator output for filtering said rectangular full-wave periodic signal, said filter means output being constructed and arranged to emit a sinusoidal signal consisting of the fundamental component of said rectangular full-wave periodic signal; and said ultrasonic transducer having an input electrically connected to said filter means output to receive said sinusoidal signal emitted by said filter means output.

3,938,072

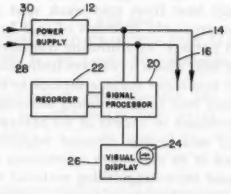
RESONANCE EARTH STRUCTURE LOGGING

Charles Baird, 77 Olive St., Oak View, Calif. 93022, and William B. Plum, 611 Colina Vista, Ventura, Calif. 93003

Filed Mar. 18, 1974, Ser. No. 452,052

Int. Cl.[2] G01V 1/00

U.S. Cl. 340—15.5 R 4 Claims



1. Apparatus for resonance earth structure logging comprising:

a. a constant frequency power supply,

b. a transducer adapted to be driven by the output of the power supply, and

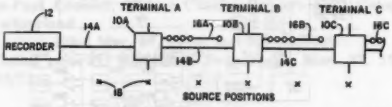
c. means for presenting the electrical relationships of the output of said power supply as said transducer is operated

at resonance while in contact with the earth, said electrical relationships versus time providing a representation of the subsurface structure of the earth.

3,938,073
DATA ARRAY NETWORK SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and Donald R. Juilfs, Chatsworth, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Continuation of Ser. No. 358,097, May 7, 1973, Pat. No. 3,881,166. This application Mar. 28, 1975, Ser. No. 563,184
Int. Cl.² G01V *1/34*
U.S. Cl. 340—15.5 TS **10 Claims**



1. A data acquisition system comprising:

a. a plurality of N spaced apart array terminals and means for collecting a plurality of M analog signals into each of said terminals:

b. means in each of said terminals for converting said analog signals and storing same in parallel to serial converter means:

c. means to connect said parallel to serial converter means in each of said terminals in series operative connection and to connect said parallel to serial converter means in each of said terminals to the buffer register means in the next in series terminal the last in series parallel to serial converter means connected to a data storage means in an array processor means:

d. means on first command to simultaneously transmit the stored digital data in each of said parallel to serial converter means to said buffer register means in the next in series terminal to last in series, said array processor data storage means, and

e. means on second command to simultaneously transmit from the buffer register in each of said terminals the data stored therein to the buffer register in the next in series terminal to last in series, said array processor data storage means,

said data acquisition system further including clock means in each of said terminals and means to transmit the clock signals from a first terminal to the next in series second terminal simultaneously with the transmission of the data stored in the buffer register means in said first terminal to the buffer register means in said second terminal.

3,938,074
FUEL ECONOMY INDICATOR

Clarence D. Fox, Decatur, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

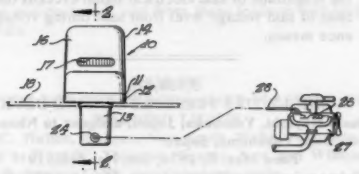
Filed Dec. 12, 1974, Ser. No. 532,075
Int. Cl.² G08B *21/00*
U.S. Cl. 340—52 R **7 Claims**

1. A fuel economy indicator device for use with an internal combustion engine having a fuel induction system,

said device including a body having actuating means secured thereto, said actuating means being arranged for connection to said induction system and adapted for actuating movement in response to pressure changes in said induction system;

luminous means;

and spaced lucidly distinct symbols disposed adjacent said luminous means, each symbol representing a condition of relative fuel economy, said symbols and said luminous means being operatively connected to said body and said actuating means for relative movement in response to actuating movement of said actuating means,

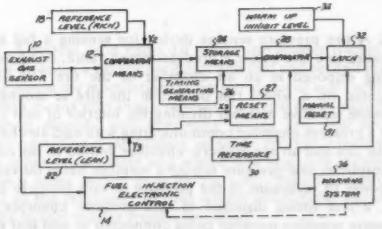


whereby respective of said spaced symbols receive varying intensity of illumination responsive to changes in induction system pressure, automatically providing a distinct indication of relative fuel economy during engine operation.

3,938,075
EXHAUST GAS SENSOR FAILURE DETECTION SYSTEM

Junuthula Nirdosh Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 30, 1974, Ser. No. 510,277
Int. Cl.² G08B *21/00*
U.S. Cl. 340—52 R **10 Claims**



1. In a fuel management system for an internal combustion engine wherein the quality of combustion of the fuel is sensed by a sensor unit in the exhaust gas, a sensor detection system comprising:

an exhaust gas sensor positioned in the exhaust gas conduit of the internal combustion engine, said sensor responsive to one of the constituent gases of combustion for generating a first electrical signal greater than a first voltage threshold level indicating a first fuel mixture and generating a second electrical signal less than a second voltage threshold level indicating a second fuel mixture;

comparator means responsive to said sensor for generating a first output signal when said first electrical signal falls below and remains below said first voltage threshold level and for generating a second output signal when said second electrical signal falls below and remains below said second voltage threshold level;

storage means responsive to said first output signal from said comparator means for storing an electrical signal during the time duration of said first output signal;

timing generating means responsive to the leading edge of said first output signal for generating a timing signal having a predetermined interval;

storage reset means responsive to the simultaneous occurrence of said timing signal and said second output signal for generating a reset signal for clearing said storage means;

a timing voltage reference means for generating a voltage level representing an interval substantially greater than said first interval, and

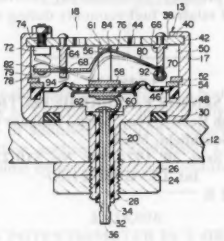
a comparator for receiving said signal from said timing voltage reference means and said electrical signal from said storage means and generating an ouput signal when the magnitude of said electrical signal exceeds the magnitude of said voltage level from said timing voltage reference means.

3,938,076

VEHICLE TIRE PRESSURE SENSING DEVICE

Tadashi Hayashi, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 5, 1974, Ser. No. 448,519
Claims priority, application Japan, Mar. 6, 1973, 48-25699
Int. Cl.² B60C *23/00*; H01H *35/24*
U.S. Cl. 340—58 4 Claims



3. A tire pressure sensing device for sensing a fall in the pressure in a tire below a predetermined value, comprising a casing disposed in an air chamber of the tire and fixedly mounted on a wheel rim on which the tire is mounted, a pressure sensitive member dividing the interior of said casing into a pressure chamber communicating with said air chamber of the tire and an atmospheric chamber vented to the outside atmosphere, said pressure sensitive member being movable in response to variations in the pressure in said pressure chamber, a leaf spring disposed in said pressure chamber, said pressure sensitive member being connected to said leaf spring to cause said leaf spring to move in accordance with movement of said pressure sensitive member, switch means actuated by movement of said leaf spring to produce an electric signal when the pressure in said pressure chamber falls below a predetermined value, said leaf spring having a portion made of two members which overlap one another and which have respectively coefficients of thermal expansion different from each other to deform said leaf spring to cause said leaf spring to actuate said switch means to produce an electric signal when the temperature of the pressure chamber exceeds a predetermined level.

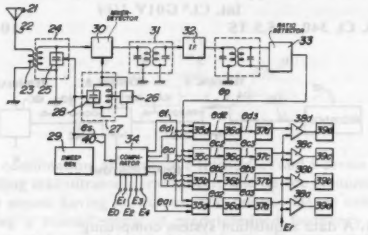
3,938,077

ALARM DEVICE FOR CONTINUALLY INDICATING THE STATE OF AIR PRESSURE IN A PLURALITY OF TIRES

Kenzo Nakanishi, and Yasuaki Hanasaka, both of Kyoto, Japan, assignors to Bridgestone Tire Company, Ltd., Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 527,010
Claims priority, application Japan, Nov. 28, 1973, 48-136400
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 17 Claims

1. An alarm device for informing reduction of pneumatic pressure of tires comprising a transmitter means including a group of transmitters provided at wheels having tires and each consisting of an oscillator circuit, an electric power supply source for said oscillator, a switch for closing an electric power supply circuit to supply the voltage to the oscillator when the internal pressure of the tire is lowered to less than a prescribed value and a radiation antenna for electromagnetic waves; a receiver means including at least one receiver antenna for reception of electromagnetic waves from the transmitters, and a receiver turning circuit capable of continuously tuning over a range of a predetermined tuning frequency covering a plurality of frequency sections; a sweep generator for sweeping said tuning circuit; a signal processing means including a comparison circuit for comparing the sweeping output of the sweep generator with reference voltages to generate gate control outputs of the multiple channels corresponding to the number of the sweep frequency sections, gate



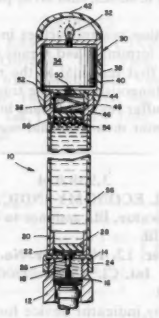
circuits for sequentially gating the output of the receiver means by said gate control signals, monostable circuits operated by the outputs of the gate circuits, pulse noise elimination circuits consisting of smoothing filters and for smoothing the outputs of the monostable circuits and comparators for comparing the smoothed DC outputs of the pulse noise elimination circuits with reference signals for discrimination of the operated transmitter; and alarm display means operated by the outputs of the signal processing means for generating and displaying alarm information.

3,938,078

LOW TIRE PRESSURE INDICATING DEVICE

Raymond D. Davis, Jacksonville, Ark., and Z. Y. Plant, Jr., Ontario, Calif., assignors to R. Davis, Jacksonville, Ark.; Z. Y. Plant and W. Tribbey, both of Ontario, Calif.

Filed Jan. 8, 1975, Ser. No. 539,388
Int. Cl.² B60C *23/04*
U.S. Cl. 340—58 11 Claims



1. A low fluid presssure indicating system comprising:
a plunger adapted to fit into and open a pressure valve assembly for releasing fluid pressure,
a first moveable piston attached to said plunger and moveable by said releasing fluid pressure,
a light assembly comprising a battery, a bulb, and a compressionable spring switch assembly electrically connected in series with each other,
said compressionable spring switch assembly providing a closed electrical path for energizing said bulb in the nor-

mal position and an open electrical path for extinguishing said bulb in the compressed position,

a second moveable piston contacting said compressionable spring switch assembly for compressing said spring switch assembly to close said electrical circuit and extinguish said bulb, and

a flexible liquid filled tube connected at one end to said first moveable piston and at the other end to said second moveable piston whereby escaping fluid pressure moves said first piston causing pressure on said liquid in said tube to move against said second piston for operating said compressionable spring switch assembly.

3,938,079

ANTI-THEFT DEVICE FOR A VEHICLE

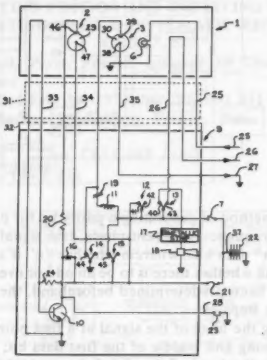
Jean-Paul Croisier, 27 rue Charles Boisser, 1223 Cologny, Switzerland

Filed Mar. 27, 1974, Ser. No. 455,189

Claims priority, application Switzerland, Mar. 27, 1973, 4393/73

Int. Cl.² B60R *25/10*

U.S. Cl. 340—64 **8 Claims**



1. An anti-theft device for a vehicle which includes an ignition circuit for the engine of the vehicle as well as a power switch, comprising, in combination:

a first casing disposed in the engine compartment of said vehicle;

a second casing disposed in the dashboard of said vehicle;

a multi-lead electric cable operable and electrically connected between said first casing and said second casing;

means operably and electrically connected to said multi-lead electric cable, said means emitting an alarm signal and switching off said ignition circuit to the engine of said vehicle when a thief attempts to switch on said power switch, or cuts said multi-lead electric cable, or opens the hood of said engine compartment, or opens the lid of the luggage trunk of said vehicle, or opens a door of said vehicle;

said ignition circuit including a vehicle battery, an ignition device and a contactor controlled by electric means;

said power switch comprising a manually-controlled power switch;

said multi-lead electric cable including at least a portion of an electric wire which enables said ignition device to be supplied with electrical energy; and

said electric wire starting from a terminal of said vehicle battery, leads to said manually-controlled power switch and from said power switch enters said first casing in said engine compartment wherein it leads to said contactor control by said electric means, and is connected from said contactor through said multi-lead electric cable to enter said second casing disposed in the dashboard of said vehicle, and from there passes again through said multi-lead electric cable back into said first casing in said engine compartment, and from there leads to said ignition device.

3,938,080

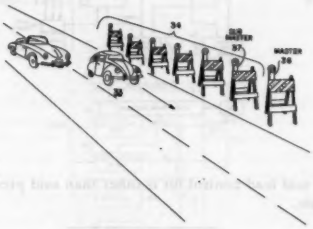
SYSTEM FOR THE PROGRAMMED FLASHING OF WARNING LIGHTS

Edwin C. Hulme, Coogee, New South Wales, Australia, assignor to Kurt W. Thurston, Sparks, Nev. and William L. Selig, Lafayette, Calif., part interest to each

Filed June 3, 1974, Ser. No. 475,575

Int. Cl.² E01F *9/00*

U.S. Cl. 340—114 B **12 Claims**



11. A system as in claim 10 where said master transmitter means includes a carrier oscillator and first and second modulating means for modulating the carrier signal of said oscillator said first means providing a modulating signal for continuously actuating directly said energizing means and said second means providing a modulating signal to prevent interference from other transmitters and where said rejecting means includes a phase locked loop having a free running frequency equal to the frequency of said second modulating signal included in said master transmitter signal.

3,938,081

CIRCUITRY FOR PREVENTING THE USE OF ERRONEOUS DATA

Robert T. Kirk, 115 S. 350 West, Bountiful, Utah 84010

Continuation of Ser. No. 356,889, May 3, 1973, abandoned, which is a continuation of Ser. No. 216,318, Jan. 10, 1972, abandoned. This application May 21, 1974, Ser. No. 471,927

Int. Cl.² G06F *11/00*

U.S. Cl. 340—146.1 R **2 Claims**

1. Circuitry for preventing the use of erroneous data in a transceiver for controlling computerized stacker cranes comprising:

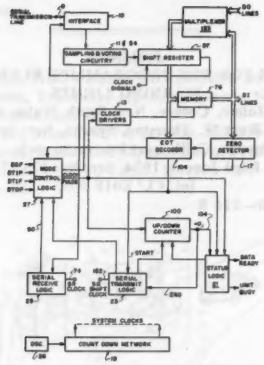
means receiving serial incoming signals comprising data bits and control bits including a lead control bit;

memory means for storing at least some of said control bits and all said data bits;

voting circuitry in communication with said memory means and to which said data bits and at least some of the control bits are communicated, said voting circuitry comprising signal comparator means;

sampling circuitry in communication with the voting circuitry and to which the lead control bit is communicated, said sampling circuitry comprising means subdividing the lead control bit into sub-parts, delay sampling means for examining intermediate sub-parts of the lead control bit and clocking the voting circuitry when the state of said intermediate sub-parts comprise a predetermined state, and means for thereafter clocking the voting circuitry causing the signal comparator means to vote on all said data bits and at least some of the control bits, whereby

approved bits are communicated to said memory means, and means turning off the voting circuitry when the state



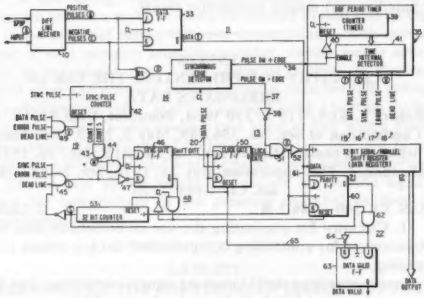
of said lead control bit is other than said predetermined state.

3,938,082

RECEIVER FOR BI-POLAR CODED DATA WITH BIT TIME INTERVAL DETECTION USED AS THE DATA VALIDATION DISCRIMINANT

Lester F. Schowe, Jr., Endwell, N.Y., assignor to General Electric Company, Binghamton, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,503
Int. Cl.[2] G08C *25/00*; H03K *5/18*; H04B *17/00*; H04L *1/00*
U.S. Cl. 340—146.1 D 6 Claims



1. In a data receiver for decoding digital data, the combination comprising,

a. means to extract the data from the received digital signal which includes a plurality of synchronizing and data bits,

b. a data storage means for storing received data,

c. Bit Period Timer means for determining from the bit period whether each received bit is a data or synchronizing bit or whether a transmission error has occurred including,

1. means for measuring the time interval between successive pulses of each received bit,

2. means for comparing the measured interval with predetermined intervals associated with data and synchronizing bits to produce data and synchronizing pulses if the measured intervals are the same as the predetermined intervals,

d. A Data Clocking Path associated with said Data Storage means for clocking received data from said data extraction means into said register, and,

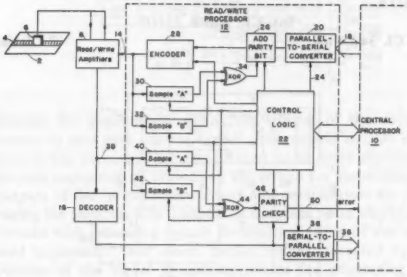
e. means for coupling Data Pulses from said Bit Period Timer means to said Data Clocking Path as enabling pulses for said clocking path to permit clocking of data into said register only if the received bit period as determined by the Bit Period Timer indicates a valid data bit has been received.

3,938,083

PARITY CHECKING A DOUBLE-FREQUENCY COHERENT-PHASE DATA SIGNAL

Garry A. G. Stansfield, Mitcham, England, assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,899
Int. Cl.[2] G06F *11/10*
U.S. Cl. 340—146.1 AG 10 Claims



1. The method of generating a parity bit for parity checking a double-frequency coherent-phase data signal having a plurality of "*n*" data bits, wherein whether "*n*" is an odd or even number and whether there is to be an odd or even parity check have both been predetermined beforehand, the method comprising the steps of:

sampling the level of the signal at a first point between the beginning and middle of the first data bit;

sampling the level of the signal at a second point between the middle and the end of the "*n*"th data bit;

comparing the levels at said two sampled points;

and generating in response to said comparison a parity bit of a level as predetermined by whether "*n*" is an odd or even number and whether there is to be odd or even parity.

3,938,084

ERROR DETECTION APPARATUS FOR VERIFYING BINARY CODED CONSTANTS

George J. Barlow, Tewksbury, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Dec. 24, 1974, Ser. No. 536,127
Int. Cl.[2] H03K *13/34*; G11B *27/36*
U.S. Cl. 340—146.1 AB 20 Claims

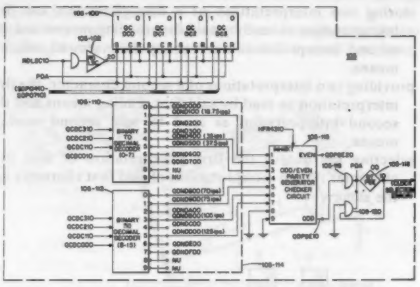
1. Error detection apparatus for verifying the correctness of a binary coded constant, said apparatus comprising:

code conversion means having a plurality of input terminals for receiving signals representative of said binary coded constant and a predetermined number of output terminals, said code conversion means being operative in response to said binary coded signals to produce output signals coded in a predetermined manner;

selection means coupled to only certain ones of said predetermined number of said output terminals; and,

check circuit means including a predetermined number of input terminals coupled to said selection means for receiving coded signals from said only certain ones of said predetermined number of output terminals, said check

circuit means being operative to generate a check signal in response to said coded signals applied to said input

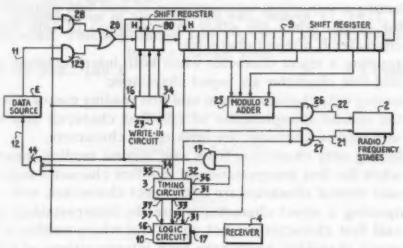


terminals for signaling that said constant is valid and the error free operation of said code conversion means.

3,938,085
TRANSMITTING STATION AND RECEIVING STATION FOR OPERATING WITH A SYSTEMATIC RECURRENT CODE

Gerard Battail, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 19, 1975, Ser. No. 551,031
Claims priority, application France, Feb. 19, 1974, 74.05592
Int. Cl.² G06F *11/08*
U.S. Cl. 340—146.1 AQ **10 Claims**

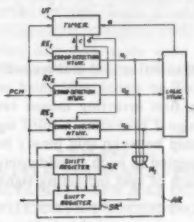


1. A transmitting station for transmitting intelligence from a binary data source, said station comprising : coding means having an input, for coding in a systematic recurrent code of length L a sequence of bits applied to said input, said coding means comprising a shift register having L successive stages, the first of said stages having an input and an output, and the last of said stages having an output, said input of said first stage forming the input of said coding means, and *m* modulo 2 adders, *m* being a positive integer, having respective outputs, each of said adders having a plurality of inputs respectively coupled to different stages of said shift-register, and an output, for delivering at its output a parity bit associated with the bit appearing at said output of said first stage; a timing circuit; first further means coupled to said timing circuit for successively applying to said input of said coding means the bits of a group of L message bits from said data source; second further means, coupled to said timing circuit, for successively applying to said input of said coding means the bits of a group of L message bits previously stored in said shift-register; controlling means, coupled to said timing circuit, for selectively actuating either said first further means or said second further means; and means for transmitting bit trains, referred to as continuation bit trains, each of which includes the L bits appearing at said first output of said first stage of said shift register upon said further means being actuated by said controlling means and the parity bits associated therewith, and further bit trains, referred to as repetition bit trains, each of which includes the L bits appearing at said output of said first stage of said shift-register, upon said second further means being actuated by said controlling means, and the parity bits associated therewith.

3,938,086
CIRCUIT ARRANGEMENT FOR CORRECTING SLIP ERRORS IN PCM RECEIVERS

Giuseppe Valbonesi, Settimo Milanese, Italy, assignor to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Apr. 11, 1975, Ser. No. 567,062
Claims priority, application Italy, Apr. 11, 1974, 21252/74
Int. Cl.² H04L *7/00*
U.S. Cl. 340—146.1 D **5 Claims**



1. In a receiver for binary code words including information bits and redundancy bits to enable detection of an error, in combination:

a line carrying incoming code words;

a plurality of error detectors including a principal detector connected to said line in parallel with one another and provided with transitory storage means for said code words;

clock means connected to said line for generating a plurality of relatively staggered trains of timing pulses respectively delivered to said error detectors for triggering same into emitting an output signal in the presence of an error-free code word on said storage means thereof, only said principal detector emitting such an output signal upon proper synchronization of said clock means with said incoming code words; and

logical circuitry connecting said error detectors to said clock means for resynchronizing same in response to an output signal from an error detector other than said principal detector.

3,938,087
HIGH SPEED BINARY COMPARATOR

Ming H. Louie, Norristown, Pa., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed May 31, 1974, Ser. No. 475,089
Int. Cl.² G06F *7/02*
U.S. Cl. 340—146.2 **23 Claims**

1. A binary comparator for determining a plurality of relationships between a first and a second binary number, each of said binary numbers having two bits, said comparator comprising:

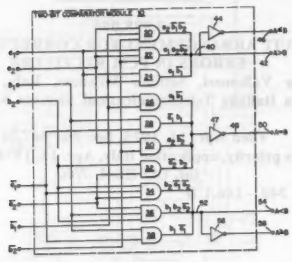
first comparing means having a plurality of inputs from bits of said first binary number and a corresponding plurality of inputs from complements of bits of said second binary number, said first comparing means providing a first signal indicating a first relationship between said binary numbers;

second comparing means having a plurality of inputs from bits of said second binary number and a corresponding

plurality of inputs from complements of bits of said first binary number, said second comparing means providing a second signal indicating a second relationship between said binary numbers;

third comparing means having a plurality of inputs from bits of said first and said second numbers and from complements of bits of said first and said second numbers providing an intermediate signal, said third comparing means further having first inverting means responsive to said intermediate signal providing a third signal indicating a third relationship between said binary numbers; and

output means coupled to each of said comparing means for transferring each of said indicating signals.



3,938,088

CHARACTER CODING AND RECOGNITION SYSTEM

Harold E. Clark, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 30, 1971, Ser. No. 214,282

Int. Cl.² G06K 7/12

U.S. Cl. 340—146.3 B **1 Claim**

1. A method for forming coded characters which are recognizable both by an individual and a machine comprising impacting a printing character against a multi-color printing band, said band comprising two or more parallel colored strips, no two adjacent strips being of the same color, to create indicia corresponding to the shape of a character on a record member;

said characters being of a size relative to said band to intersect more than one but less than all the strips in said band when impacted against said band; and,

shifting said characters and said band relative to one another in predetermined manner to code different characters with different color combinations or different color strip positions contained in the band.

3,938,089

DOUBLE READ SYSTEM FOR CHARACTER RECOGNITION SYSTEMS

Arvin D. McGregor, and William E. Holmes, both of Birmingham, Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Feb. 25, 1974, Ser. No. 445,773

Int. Cl.² G06K 9/00

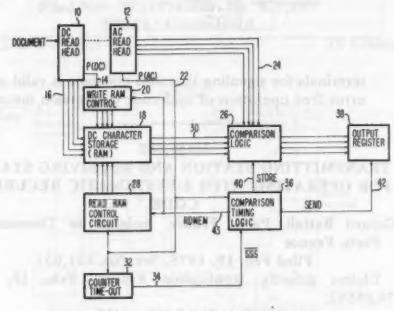
U.S. Cl. 340—146.3 D **17 Claims**

1. In a method of reading characters which includes the steps of reading each character with a first reading means and again reading each character with a second independent and different reading means, the improvement comprising the steps of:

storing two interpretations of a first character, the first interpretation as read by said first reading means and the second interpretation as read by said second reading means;

providing two interpretations of a second character, the first interpretation as read by said first reading means and the second interpretation as read by said second reading means;

selecting for output the first interpretation of said first character if both interpretations of said first character are the same;



selecting a non-reject interpretation of said first character for output when the other interpretation of said first character is a reject character;

outputting a reject character when both interpretations of said first character are reject characters;

selecting only characters from said first reading means when the second interpretation of said first character and of said second character are both reject characters;

selecting only characters from said second reading means when the first interpretation of said first character and of said second character are both reject characters; and

outputting a reject character where the interpretations of said first character are not equal, but where neither is a reject character, and where both interpretations of said second character are equal and not reject characters.

3,938,090

TERMINAL APPARATUS

Victor Scott Borison, Middletown; Hans George Mattes, Ocean Township, Monmouth County; Colonel Blake McDowell, III, Holmdel; George William Schramm, Oakhurst; Gerald Steven Soloway, Morganville, and John William Wesner, Jr., Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 13, 1975, Ser. No. 549,472

Int. Cl.² G06F 3/04; H04M 11/06; H04Q 9/00

U.S. Cl. 340—149 A **30 Claims**

1. Terminal apparatus for assembling data representing a proposed business transaction, for communicating said data to a remotely located central data base and for receiving responses from said central data base concerning said proposed transaction, comprising in combination:

a magnetic stripe card reader for reading said data related to said proposed transaction coded on magnetic stripes;

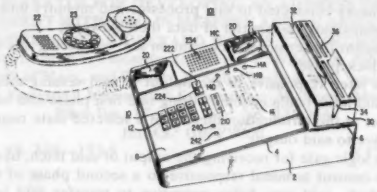
a keyboard for entering said data related to said transaction;

a microprocessor for receiving and processing said data from said card reader and said keyboard and for producing outputs controlling said terminal apparatus;

instruction lights operable in sequence for controlling the entry of said data into said terminal apparatus;

a decoder responsive to first ones of said outputs for sequencing said lights;

means responsive to second ones of said outputs for establishing a communications link with said central data base;



detector means for detecting a first one of said responses from said central data base and providing a signal to said microprocessor representative of said first one of said responses;

means responsive to third ones of said outputs subsequent to said detecting of said first one of said responses for applying said data to said communications link; and

means receiving a second one of said responses for indicating subsequent steps in said proposed transactions.

3,938,091

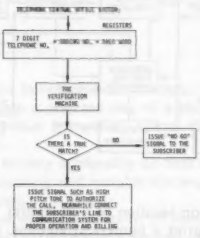
PERSONAL VERIFICATION SYSTEM

Martin M. Atalla, Portola Valley, and Alexander F. Liu, San Jose, both of Calif., assignors to Atalla Technovations Company, Sunnyvale, Calif.

Continuation of Ser. No. 235,641, March 17, 1972, abandoned. This application July 19, 1974, Ser. No. 490,179

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—149 A **7 Claims**


REGISTERS
7 DIGIT TELEPHONE NO.
TDC VERIFICATION MACHINE
IS THERE A TDC MATCH?
NO
ISSUE "NO GO" SIGNAL TO THE SUBSCRIBER
YES
ISSUE SIGNAL SUCH AS HIGH PITCH TONE TO AUTHORIZE THE CALL, MEANWHILE CONNECT THE SUBSCRIBER'S LINE TO COMMUNICATION SYSTEM FOR PROPER OPERATION AND BILLING

1. The method of operating a personal verification system including encoding means and code word input means coupled to the encoding means for verifying the authority of an individual to complete transactions on the basis of the combination of an individual code word which is peculiar to the individual, a secret code word which need only be known to the individual and a compiled code word which is derived from the other of the code words, the method comprising the steps, performed in selected sequence, of:

preparing a logical encoding status in accordance with a selected logical combination of both the individual code word and a secret code word received from the individual prior to verification of his authority to complete a transaction;

encoding the combination of both the individual code word and the secret code word received from the individual in accordance with said logical encoding status to produce a compiled code word therefrom;

preparing a record of said compiled code word for subsequent use in verifying the authority of the individual to complete a transaction;

applying to the code word input means of the system both an individual code word for identifying the individual attempting to complete a transaction and a secret code word from such individual;

preparing a logical encoding status in the encoding means of the system in accordance with said logical combination of both the individual code word and secret code word applied to the code word input means of the system;

encoding the combination of both the individual code word and the secret code word applied to the code word input means in accordance with said logical encoding status prepared in the encoding means of the system to produce a corresponding compiled code word therefrom;

comparing said corresponding compiled code word with the compiled code word from said record for the authorized individual having such individual code word; and

controlling completion of the transaction in response to the comparison of the compiled code word from said record with said corresponding compiled code word produced from the applied individual code word and secret code word received from the individual attempting to complete the transaction.

3,938,092

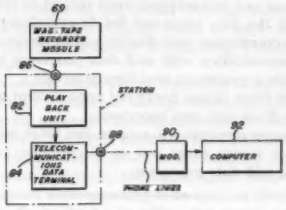
SYSTEM FOR TELECOMMUNICATING VEHICLE OPERATION DATA BETWEEN A GROUND STATION AND A REMOTE DATA PROCESSING STATION

Bernard E. Callahan, Hoffman Estates, Ill., assignor to Vapor Corporation, Chicago, Ill.

Division of Ser. No. 379,371, July 16, 1973, Pat. No. 3,864,731. This application Sept. 6, 1974, Ser. No. 503,725

Int. Cl.[2] G11B *1/00, 5/00;* **G01D** *9/00;* **H04Q** *9/00*

U.S. Cl. 340—150 **4 Claims**



1. A vehicle data recorder-playback system comprising:

a portable tape recorder module for recording and playing back vehicle engineering operation data, the module including;

a. a self-contained magnetic tape,

b. magnetic tape head means contacting the tape for reading data in and out of the tape,

c. means for driving the tape across the head means,

a ground station including;

d. playing back means removably connected with the module for controlling data playback,

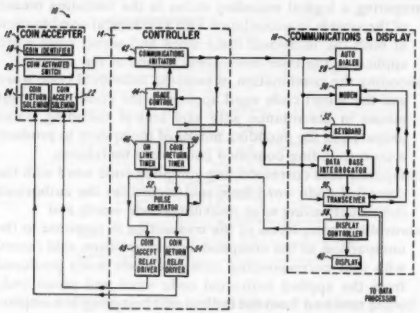
e. connector means located on the module and the playing back means for facilitating insertion and removal of the module from the playing back means, and

f. means connected to the output of the playing back means for communicating played back data to a remote data processing station.

3,938,093
COIN OPERATED TERMINAL

Joseph A. Riess, Dayton, Ohio, assignor to Quote, Inc., Dayton, Ohio

Filed July 2, 1974, Ser. No. 485,097
Int. Cl.² H04Q *5/00*
U.S. Cl. 340—152 R **7 Claims**



1. A terminal adapted for communication with a remote data processor comprising

terminal communication means including a transceiver and a modem for communicating with the data processor,

display circuit means for displaying information received from the data processor,

switch means,

and controller circuit means,

said controller circuit means including communication initiator means responsive to said switch means energizing said terminal communication means and said display circuit means to initiate communication with said data processor,

first timer means energized upon actuation of said switch means and de-energized upon receipt of communications from the data processor for de-energizing said terminal communication and display circuit means in the event communication with said data processor is not initiated within a predetermined time interval,

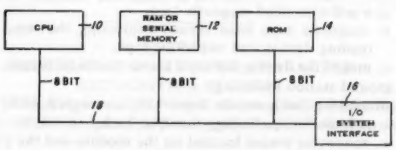
on-line timer means energized upon receipt of communication from said data processor,

and means responsive to said on-line timer means when said timer means times out to discontinue communication with said data processor.

3,938,094
COMPUTING SYSTEM BUS

Edward R. Caudel, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 176,670, Aug. 31, 1971, abandoned. This application Aug. 28, 1973, Ser. No. 392,405
Int. Cl.² G06F *13/00*
U.S. Cl. 340—172.5 **23 Claims**



1. In a calculating system which includes a central processor unit connected to a memory unit spaced from said processor, said memory unit being connected to said processor by a parallel bus system that sequentially transmits data between said processor unit and memory unit, circuit means for detecting an output current on said bus and for generating a voltage input signal for said bus, comprising:

a. first gating means connecting said memory unit with said bus for selectively generating a current on said bus corresponding to data which is to be transmitted from said memory unit to said processor;

b. a multi-phase clock system having first and second clock phases connected to said processor and memory unit for controlling transmittal of data therebetween;

c. means for sensing the current on said bus during said first clock phase;

d. a latch responsive to the output of said sensing means, said latch being enabled during said first phase and being set at the termination thereof to a selected state responsive to said output;

e. a logic gate for receiving the output of said latch, having a control terminal responsive to a second phase of said clock, said gate being operative to transfer said latch output during said second phase;

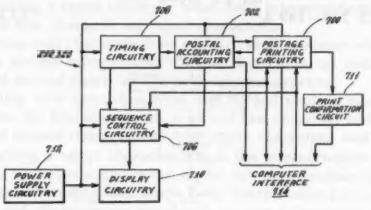
f. voltage generating means coupled to said gate and said bus for generating a voltage signal on said bus responsive to the output level of said logic gate; and

g. second gating means responsive to said second phase for transferring said voltage signal to said processor.

3,938,095
COMPUTER RESPONSIVE POSTAGE METER

Frank T. Check, Jr., Orange; Alton B. Eckert, Jr., Norwalk; Bruce E. Hinman, Ridgefield; Howell A. Jones, Jr., Fairfield; Raymond R. Lupkas, Trumbull, and Robert B. McFiggans, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Continuation-in-part of Ser. No. 195,694, Nov. 4, 1971, abandoned. This application Oct. 16, 1973, Ser. No. 406,898
Int. Cl.² G06F *15/24*; G07B *17/02*, *17/04*
U.S. Cl. 340—172.5 **4 Claims**



1. In the combination of a computer and metering means arranged to print a numerical amount, said metering means including means for receiving from said computer a signal designating said amount, printing means responsive to said signal receiving means, an addressable memory for storing a balance, an arithmetic unit responsive to said memory and said signal receiving means to alter said balance by said computer-designated amount each time said printing means is actuated, memory addressing means for fetching a present balance from a predetermined memory address and conveying it to said arithmetic unit for said balance altering operation and loading the new balance resulting from such operation back into said same memory address, said memory addressing means comprising:

a pulse stream source, a first counter responsive to said pulse stream, a gate responsive to said first counter, a second counter responsive to said gate, means for selecting a memory address in response to said second counter, means for detecting the beginning of a count sequence of said first counter, means for detecting the end of a count sequence of said second counter, and means responsive to both said count sequence detecting means for enabling

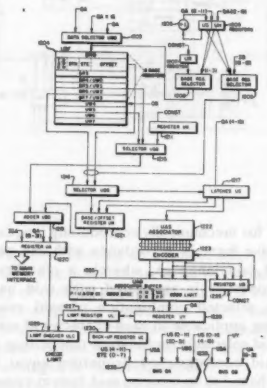
said gate to start a memory addressing count sequence of said second counter at the beginning of said first count sequence, and for disabling said gate at the end of said memory addressing count sequence.

3,938,096

APPARATUS FOR DEVELOPING AN ADDRESS OF A SEGMENT WITHIN MAIN MEMORY AND AN ABSOLUTE ADDRESS OF AN OPERAND WITHIN THE SEGMENT

James L. Brown, Chelmsford; Richard P. Wilder, N. Billerica, both of Mass., and Richard P. Kelly, Nashua, N.H., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 17, 1973, Ser. No. 425,356
Int. Cl.[2] G06F 9/00
U.S. Cl. 340—172.5 8 Claims



1. An apparatus for developing an absolute address for a selected operand within a selected one of a plurality of variable size segments within a memory space, said apparatus comprising:

a. first means for storing a plurality of first addresses for identifying and locating said variable size segments within said memory space;

b. second means for storing a plurality of second addresses for identifying said variable size segments and for providing an address of a first byte of said selected operand within said variable size segments;

c. third means, coupled to said second means, for selecting one of said second addresses;

d. fourth means, in said first means and coupled to said second and third means, for matching the variable segment of said selected one of said second addresses with one of the variable segments of said first addresses;

e. fifth means, coupled to said first, second and third means and responsive to said fourth means, for adding said selected one of said second addresses to one of said first addresses whose segment matches the segment of said selected one of said second addresses; and,

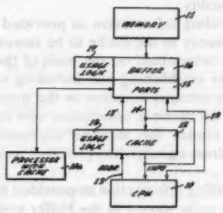
f. sixth means, coupled to said fifth means, for storing a third address of said selected operand said third address being the address of a selected byte in said operand relative to the first byte, and whereby said fifth means adds said third address to said first and second addresses to generate the absolute address of a byte within said selected operand.

3,938,097

MEMORY AND BUFFER ARRANGEMENT FOR DIGITAL COMPUTERS

Reaman Paul Niguette, III, New Canaan, Conn., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 1, 1974, Ser. No. 456,537
Int. Cl.[2] G06F 13/00
U.S. Cl. 340—172.5 27 Claims



1. In a digital, stored program computer having a random accessible memory and a central processing facility with an information flow path to and from memory, from and to the processing facility including a path for memory addresses to the memory and paths for other information taken from and to be provided to memory locations, the improvement comprising:

a random accessible buffer having a plurality of storage blocks, each block having a plurality of storage locations, each block further having means for storing addresses for identifying the locations in the block, the buffer upon receiving addressing signals corresponding to an address identifying a location in the buffer by its addressing signals providing access to that location, the buffer having significantly less storage space than the memory but significantly faster access to each of its location than to any memory location;

means in the buffer determining a recency of usage ranking among the blocks of the buffer corresponding to the respective last access request made to each block, to obtain a criterium used for determining availability of storage space;

a random accessible cache having a plurality of blocks, each block having a plurality of storage locations, each block further having means for storing addresses for identifying the locations in the block each as a location corresponding to an address and location in the memory and in the buffer as stored therein, the cache upon receiving addressing signals corresponding to an address identifying a location in the cache by its addressing signals providing access to that location, the cache having significantly less storage space than the buffer but significantly faster access to each location than the buffer;

means for establishing representation of availability of storage space in the cache including establishing a limit on the number of accesses to a cache block of the plurality.

means connecting the cache to the processing facility for transmitting to the address storage means in the cache memory addresses for access requests to locations in the cache and for purposes of reading in each instance the content of a location whose stored address corresponds to such memory address, the cache having means for transferring the content of a successfully accessed cache location to the processing facility;

means for causing the memory address provided by the processing facility to be transferred to the buffer if a corresponding location was not found in the cache;

means connected to the buffer for receiving the said memory address as transferred by the last-mentioned means and for applying such address to the address storage means in the buffer, for transferring the content of the successfully accessed buffer location having said address

to the processing facility; or for receiving from the processing facility information for storage in the successfully accessed buffer location as defined by the address;

means for causing the memory address provided by the processing facility to be transferred to the memory if a corresponding location is represented neither in the cache nor the buffer for accessing the location, so that the particular memory location having said latter address provides the corresponding information it contains to the processing facility;

means for providing information as provided by the buffer or by the memory to the cache to be stored in a location of the cache determined on the basis of the operation of the means for establishing and including storing the address of such memory location in the means for storing addresses in the cache in association with the latter cache location to render the location addressible by corresponding address signals when provided by the processing facility;

means for providing information as provided by the memory to the buffer to be stored in the buffer and in a location there as determined on the basis of the recency of usage ranking determining means; and

means for transferring the content of a buffer location which received information from the processing facility, to the memory independently from the time of receiving such information.

3,938,098

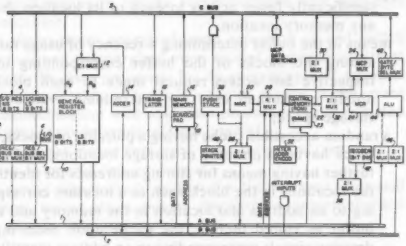
INPUT/OUTPUT CONNECTION ARRANGEMENT FOR MICROPROGRAMMABLE COMPUTER

Richard A. Garlic, Irvine, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 16, 1973, Ser. No. 428,597

Int. Cl.[2] G06F *3/00, 9/06*

U.S. Cl. 340—172.5 **10 Claims**



1. In a microprocessor comprising: a control memory for storing control words at addressable locations, means for addressing said control memory, a first bus, a second bus and a third bus;

a. an input/output device external to said microprocessor and connected to said first, second and third buses, said input/output device having an address,

b. means for interrupting the means for addressing said control memory,

c. means responsive to said means for interrupting for modifying the address of said control memory to a desired address,

d. means associated with said input/output device for placing said address of said input/output device on said first bus,

e. means associated with said input/output device for placing input signals on said second bus,

f. means responsive to a control word at said desired address for utilizing said first bus input signals for identifying said input/output device, and

g. means for executing said control word at said desired address to operate upon said second bus input signals.

3,938,099

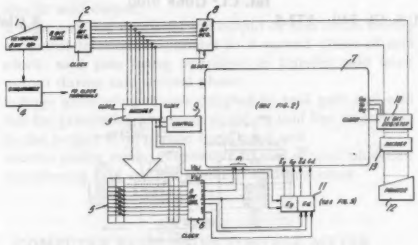
ELECTRONIC DIGITAL SYSTEM AND METHOD FOR REPRODUCING LANGUAGES USING THE ARABIC-FARSI SCRIPT

Syed Salahuddin Hyder, Paris, France, assignor to Alephtran Systems Ltd., Montreal, Canada

Continuation-in-part of Ser. No. 303,277, Nov. 2, 1972, abandoned. This application Mar. 15, 1974, Ser. No. 451,481

Int. Cl.[2] G06K *15/02;* **B41J** *5/00*

U.S. Cl. 340—172.5 **6 Claims**



1. A system for mechanically reproducing language characters in a cursive form in accordance with the natural style calligraphy of said language, wherein a plurality of *j* cancatenation properties is associated with said natural style calligraphy, a selected combination of said cancatenation properties being applicable to each character of said language characters, said selected combination comprising an integral number of said concatenation properties equal in number from *j* to O where *j* is an integer; said system comprising;

a. input means for inserting characters one at a time and for providing coded representations of characters which do concatenate and coded representations of characters which do not concatenate,

b. said input means providing coded representations associated with spaces between groups of characters,

c. decoder means for receiving said coded representations of said characters for providing output signals associated with said coded representation,

d. said decoder means providing a first group of output signals associated with said coded representation of characters which do not concatenate, and a second group of output signals associated with said coded representation of characters which do concatenate,

e. means responsive to said output signals from said decoder means for storing coded representations of a successive string of characters comprising a character under consideration, a preceding character and a following character,

f. means for analyzing said stored coded representations of said successive string of characters according to the concatenation properties of said character under consideration, said preceding character and said following character, said analyzer means providing further coded representations whereby said further coded representations are representative of the applicable concatenation property,

g. means for combining said coded representations from said input means with said further coded representations to provide a composite coded representation containing information corresponding to said character under consideration and its applicable concatenation property, and

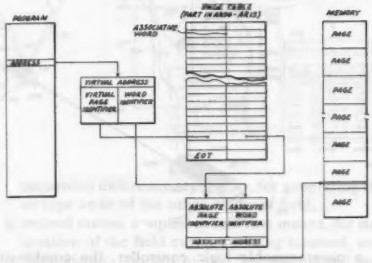
h. output means for receiving said composite coded representations for reproducing said characters with the natural style calligraphy.

3,938,100

VIRTUAL ADDRESSING APPARATUS FOR ADDRESSING THE MEMORY OF A COMPUTER UTILIZING ASSOCIATIVE ADDRESSING TECHNIQUES

Louis Kent Steiner, Blaine, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed June 7, 1974, Ser. No. 477,215
Int. Cl.² G06F *9/20, 13/00*
U.S. Cl. 340—172.5 **8 Claims**



1. Apparatus for forming an absolute address for accessing a memory of a computer comprising, in combination:

a plurality of ordered register means each being capable of storing a respective associative word, each associative word having a respective absolute page identifier and a respective virtual page identifier, said register means being arranged in sequential order;

read means for sequentially reading associative words from said memory into the highest ordered register means;

shift means for sequentially shifting associative words from a higher ordered register means to a lower ordered register means;

receiver means for receiving a virtual address from a job program, said virtual address having a virtual page identifier and a virtual word identifier;

compare means connected to said receiver means and at least one of said register means for comparing the virtual page identifier of said virtual address in said receiver means with the virtual page identifier in said one of said register means, said compare means providing a signal indicative of the correspondence or non-correspondence between the virtual page identifier of said virtual address and the virtual page identifier of the associative word in said any of said register means;

first control means, responsive to the signal indicative that said compare means senses a correspondence between the virtual page identifier of said virtual address and a virtual page identifier of an associative word,

for transferring the associative word containing the corresponding virtual page identifier from a lower ordered register means to the highest ordered register means, and

for operating said shift means to shift associative words, previously stored in register means having a higher order than the said lower ordered register means from which the transferred associative word was transferred, to the next lower ordered register means; and

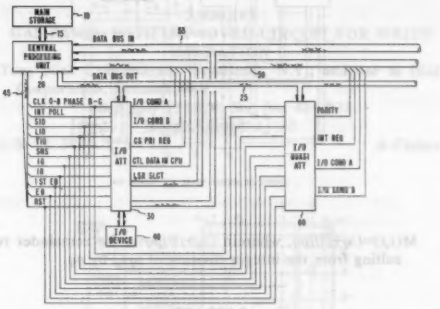
storage address register means responsive to said compare means for storing the absolute page identifier of the associative word containing said corresponding virtual page identifier.

3,938,101

COMPUTER SYSTEM WITH POST EXECUTION I/O EMULATION

David O. Lewis; Thomas H. Miller, and Steven A. Schmitt, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,633
Int. Cl.² G06F *3/00*
U.S. Cl. 340—172.5 **17 Claims**



1. In a computer system includingn a main storage, a central processing unit connected to said main storage, at least one I/O attachment device connected to said central processing unit, and an I/O device connected to said I/O attachment device, said main storage storing sequences of instructions for operating an I/O device other than said I/O device connected to said I/O attachment device, the improvement comprising

a quasi I/O attachment connected to said central processing unit and responsive to instructions for operating said other I/O device for generating a control signal, and

means within said central processing unit responsive to said control signal for issuing control signals to said I/O attachment device to control the operation of said I/O device connected thereto according to the instructions for operating said other I/O device.

3,938,102

METHOD AND APPARATUS FOR ACCESSING HORIZONTAL SEQUENCES AND RECTANGULAR SUB-ARRAYS FROM AN ARRAY STORED IN A MODIFIED WORD ORGANIZED RANDOM ACCESS MEMORY SYSTEM

Thomas Harvey Morrin, San Jose, and David Curtis Van Voorhis, Los Gatos, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 19, 1974, Ser. No. 498,352
Int. Cl.² G06F *15/20*
U.S. Cl. 340—172.5 **5 Claims**

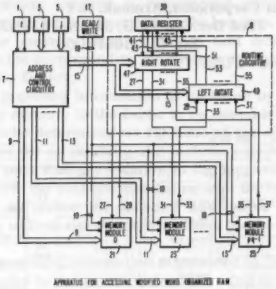
1. A word organized random access memory system modified for image processing operations so that the pq image points of any $1 \times pq$ or $p \times q$ subarray of any $rp \times sq$ image array I(*,*), of points storable in the memory system can be retrieved from or written into the system in a single memory cycle, each image point I(i,j) assuming a Boolean value when i and j lie respectively in the ranges $0 \quad i<rp-1$ and $0 \quad j<sq-1$, the system comprising:

memory means (**21, 23, 25**) for storing *rpsq* image points in the cells of *pq* different memory modules, each memory module being an entity capable of storing *rs* image points in distinguishable cells, only one cell of each module being accessible at any single instant of time; and

accessing means (**7, 39, 47, 49, FIGS. 3–9**) for causing each image point I(i,j) to be retrieved from or written into cell location A(i,j) of the M(i,j)th memory module, where the integer valued functions A(i,j) and M(i,j) are defined by

the relations:

$A(i,j)=(i/p)s+j/q$, wherein i/p and j/q are integer quotients,



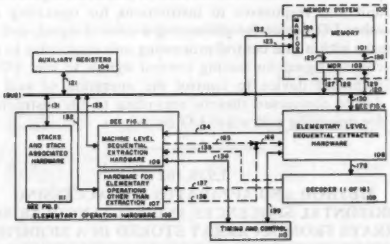
$M(i,j)=(iq+j)//pq$, wherein $(iq+j)//pq$ is the remainder resulting from the integer division of $iq+j$ by pq.

3,938,103

INHERENTLY MICRO PROGRAMMABLE HIGH LEVEL LANGUAGE PROCESSOR

Andrew M. Wein, Rte. 1, Waldo, Ohio 43356

Filed Mar. 20, 1974, Ser. No. 452,819
Int. Cl.² G06F 7/00
U.S. Cl. 340—172.5 **25 Claims**



1. An inherently microprogrammable high level language processor which includes an electrical interconnection with a storage device for executing an interpretable language string stored in said storage device, wherein said string includes machine level operation codes, and for executing one of a plurality of elementary language programs stored in said storage device, each program being represented by a machine level operation code, comprising:

a. first extration means for extracting a machine level operation code via said electrical interconnection from said interpretable language string stored in said storage device for use in locating the one of the elementary language programs stored in said storage device which is represented by the extracted code;

b. second extraction means for extracting an elementary language operation code via said electrical interconnection from said one elementary language program stored in said storage device;

c. decoding means for decoding the extracted elementary language operation code; and

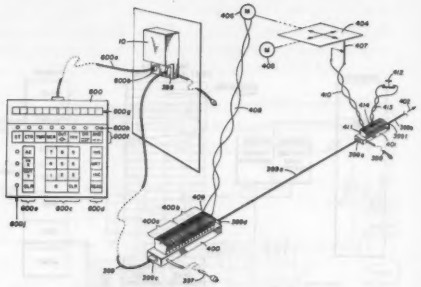
d. logic means connected to said decoding means for executing the elementary operation which is represented by the elementary language operation code.

3,938,104

SYSTEM FOR MODIFYING A LOGIC CONTROLLER INSTRUCTION SET

Raymond W. Henry, Dallas, Tex., and Anthony F. Zizzo, Phoenix, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 7, 1974, Ser. No. 431,442
Int. Cl.² G06F 3/02
U.S. Cl. 340—172.5 **10 Claims**



1. In a programmable logic controller, the combination comprising:

a. a read/write memory for storing multibit instructions which direct computations in said controller;

b. a programming keyboard module connected to said controller for encoding instructions to be stored in said memory;

c. means operable cyclically to read said instructions from said memory for operation of said controller;

d. a temporary storage means;

e. program counter means for generating memory addresses;

f. first logic means responsive to a first keyboard command for transferring instructions from said keyboard module via said temporary storage means to said memory; and g. second logic means responsive to a second keyboard command for inserting a new instruction at a location in said memory having a designated address and sequentially shifting each instruction in said memory stored at a location having an address beyond said designated address to a memory location having an address once removed, said second logic means including:

i. means for transferring said new instruction to said temporary storage means;

ii. means for setting said program counter means to said designated address;

iii. means for transferring the instruction in said temporary storage means to said memory at the address according to said program counter means and concomitantly transferring the instruction at said address to said temporary storage means; and

iv. means for controlling said program counter means to sequentially access each address beyond said designated address.

3,938,105

SEQUENTIALLY ENCODED DATA STRUCTURES THAT SUPPORT BIDIRECTIONAL SCANNING

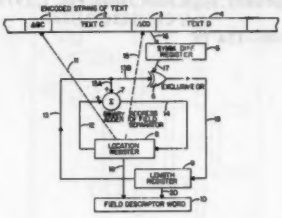
Robert J. Lechner, Needham, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed June 24, 1974, Ser. No. 482,406
Int. Cl.² G06F 7/00
U.S. Cl. 340—172.5 **21 Claims**

1. A bidirectional scanning apparatus for determining, in a forward or reverse direction, the address of a next sequential field desired in a sequence of fields of variable length, said fields in said sequence being separated from each other by

symmetric difference separators, each symmetric difference separator comprised of the carry-free exclusive-OR addition of the values of the lengths of its adjacent fields on either side of said symmetric difference separator, said bidirectional scanning apparatus comprising:

a. first means, responsive to one of said sequential difference separators currently being scanned and to a length or type code for one adjacent field of said one of said



sequential difference separators, for generating the length or type code of the other adjacent field;

b. second means, coupled to said first means, for storing the location of the field currently being scanned; and,

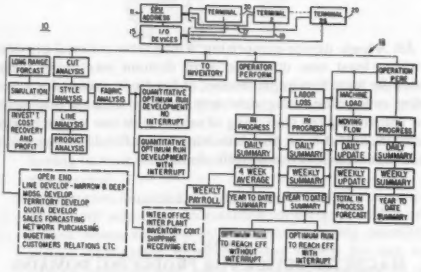
c. third means, coupled to said first and second means, for algebraically adding the length of either adjacent field to the location of the separator preceding the left edge of the field currently being scanned, whereby the address of the next sequential field separator desired is generated.

3,938,106

PRODUCTION DATA GATHERING AND PROCESSING SYSTEM

Bernard E. Becker, 675 Serramonte, Marietta, Ga. 30062; Virgil D. Baker, III, 2296 Eastway Road, Decatur, Ga. 30033, and Theodore S. Britton, 6900 Castleton Drive, NW., Atlanta, Ga. 30328

Filed Dec. 4, 1974, Ser. No. 529,366
Int. Cl.² G06F *3/04*
U.S. Cl. 340—172.5 **19 Claims**



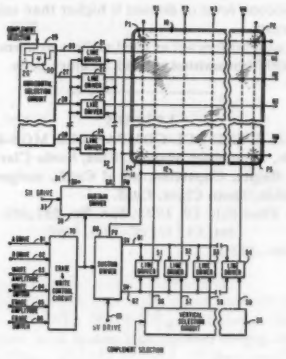
1. A system for gathering and processing data from a production line along which work units sequentially undergo a plurality of different operations respectively performed at a plurality of work stations, said system comprising data media respectively associated with the work units for travel therewith and containing signature data therefor; a plurality of addressable data terminals equal in number to and respectively disposed at the work stations and being coupled to a common communication channel; each of said data terminals including data input means for acquiring the signature data of each work unit from its data medium when the work unit is at the associated work station, transmitting means coupled to said data input means for transmitting the work unit signature data on the communication channel, and address data receiving means coupled to said data transmitting means for actuating same in response to receipt on the communication channel of an address data signal corresponding to that data terminal; a central processing unit including means for sequentially addressing said data terminals on the common communication channel sequentially to actuate said transmitting means thereof for transmitting signature data to the central processing unit; and means for retrieving data from said central processing unit for analysis of the production process.

3,938,107

GAS PANEL WITH IMPROVED CIRCUIT FOR WRITE OPERATION

Tony Nick Criscimagna, Woodstock, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed July 1, 1974, Ser. No. 484,835
Int. Cl.² G11C *11/28*
U.S. Cl. 340—173 PL **6 Claims**



1. In a gas panel of the type having light emitting cells formed at crossover points of horizontal and vertical conductors and means for producing an alternating polarity sustain waveform across the conductors for each cell, the improvement comprising,

means for producing opposite polarity write pulses of an amplitude and width to establish a value of wall charge accumulation that is less than the value required for a write operation, and

means for applying said write pulses to the horizontal and vertical conductors of a selected cell in the polarity of the sustain waveform for a plurality of sequential sustain half cycles to produce a write operation.

3,938,108

ERASABLE PROGRAMMABLE READ-ONLY MEMORY

Phillip J. Salsbury, Sunnyvale, and George Perlegos, Santa Clara, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 3, 1975, Ser. No. 546,546
Int. Cl.² G11C *11/40*; H03K *5/00, 3/26, 3/353*
U.S. Cl. 340—173 R **19 Claims**

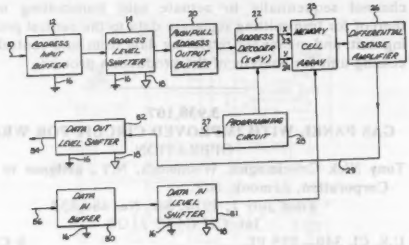
1. A read-only memory deployed on a doped silicon substrate comprising:

a first region on said substrate having a higher dopant level than said substrate;

a plurality of memory cells disposed in said first region, each of said cells including a floating gate for storing charge;

a plurality of buffers disposed on said substrate, spaced apart from said first region, for communicating signals to said memory cells, each of said buffers including a plural-

ity of field-effect transistors having channels with a first level of dopant and at least one field-effect transistor having a channel with a second level of dopant wherein



said saecond level of dopant is higher than said first level of dopant;

whereby said buffers act as level shifters to permit signals to be readily transmitted to said memory cells.

3,938,109

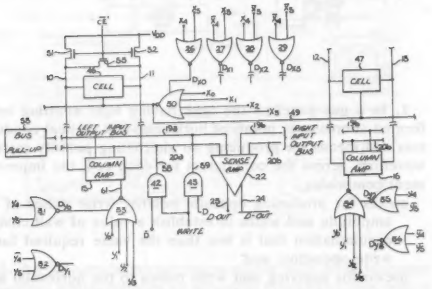
HIGH SPEED ECL COMPATIBLE MOS-RAM

John Gionis, Sunnyvale; Mark S. Ebel, Santa Clara, and William M. Regitz, Cupertino, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Feb. 19, 1975, Ser. No. 551,001

Int. Cl.² G11C 7/06, 8/00

U.S. Cl. 340—173 R **16 Claims**



1. A metal-oxide-silicon, random-access memory which is compatible with emitter-coupled logic and which is deployed on a single substrate comprising:

a plurality of memory cells for storing information;

a plurality of sensing means for sensing information in said memory cells, coupled to said memory cells;

a plurality of timing signal generators for generating timing signals coupled to said memory cells and to said sensing means;

a plurality of input buffers for receiving input signals to said memory, each of said buffers having at least two input terminals, one of said input terminals for receiving a reference signal and the other of said terminals for receiving an input signal, each of said buffers including circuit means for adjusting the sensitivity of said buffer to said input signal as a function of the magnitude of said reference signal;

whereby said memory will be compatible with external logic circuitry.

3,938,110

METHOD OF CONTROLLING MAGNETIC STRIP DOMAINS

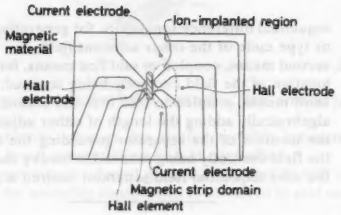
Shoei Kataoka; Toshio Tsurushima, both of Tanashi; Yoshinobu Sugiyama, Akishima; Hisao Tanoue, Tanashi; Hideo Yamada, Kawasaki, and Yasuo Komamiya, Yokohama, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,727

Claims priority, application Japan, Feb. 7, 1973, 48-14613

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF **41 Claims**



33. A logic device comprising: a magnetic material provided with at least one magnetic strip domain stretching region made by local ion-implantation, at least one means for generating at least one magnetic strip domain, at least one means for controlling the stretching of said at least one magnetic strip domain, and at least one detecting means for detecting said at least one controlled magnetic domain.

3,938,111

MAGNETIC DEVICE FOR PRODUCING DOMAINS

Coenraad Jozef Maria Rooijmans; Willem Frederik Druyvesteyn, and Jan Willem Frederik Dorleijn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 13, 1974, Ser. No. 450,760

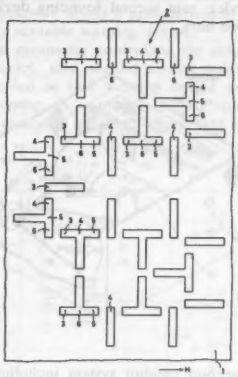
Claims priority, application Netherlands, Mar. 13, 1973, 733464

Int. Cl.² G11C 11/14

U.S. Cl. 340—174 TF **3 Claims**

1. A magnetic device comprising at least one thin layer of a magnetizable material having a preferred direction of magnetization with a uniaxial anisotropy field H_K substantially at right angles to the surface of the layer, means to produce a magnetic field having a strength exceeding the uniaxial anisotropy field in the plane of the layer which does not change

direction whereby the layer is homogeneously magnetized, and means to reduce the magnetic field in the plane of the



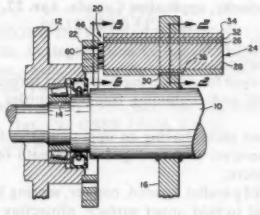
layer to zero whereby magnetic domains are produced in the layer.

3,938,112

TUBULAR WHEEL SPEED SENSOR

Thomas A. Gee, Allen Park, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 12, 1974, Ser. No. 460,325
Int. Cl.² G08C *19/12*
U.S. Cl. 340—195 **10 Claims**



1. A rotation indication system for generating signals in response to the rotation of a body, said indication system comprising:

a rotor affixed to and rotatable with said body, said rotor having at least one array of apertures on the outer periphery thereof;

sensing means mounted proximate to said rotor and cooperating with said rotor to establish an air gap, said sensing means being retained in a tubular housing permitting proper orientation of said sensing means for use with various sizes of said rotor or various spacings of said apertures in said rotor;

means for mounting said sensing means, said mounting means permitting said tubular housing and said sensing means retained thereby to move axially relative to said rotor while preventing angular movement of said tubular housing, said tubular housing being parallel to the axis of said body and spaced a predetermined distance from said axis;

gauging means adjacent said sensing means, said gauging means projecting from said sensing means and being in contact with said rotor for limiting axial movement of said sensing means;

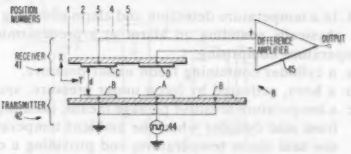
said sensing means comprising a source of magnetic flux, means for producing a split magnetic flux path, and coil means, said split magnetic flux path being interrupted by said apertures when said rotor is rotated producing a flux change, said flux change inducing an output signal in said coil means, said coil means being minimally responsive to any flux change caused by relative axial movement between said sensing means and said rotor.

3,938,113

DIFFERENTIAL CAPACITIVE POSITION ENCODER

Donald R. Dobson, Versailles, and Robert A. Williams, Lexington, both of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 17, 1974, Ser. No. 480,088
Int. Cl.² G08C *19/10*
U.S. Cl. 340—200 **4 Claims**



1. A capacitive transducer, comprising:

a transmitter portion having a planar surface and incorporating a plurality of parallel conductive surfaces thereon arranged as a transmitter grating having length L and width W;

a receiver portion having a planar surface and incorporating a plurality of parallel conductive surfaces of period P thereon arranged as a receiver grating having length L′ comparable to length of said transmitter grating and width W′ that is substantially less than width W of said transmitter grating;

means mounting said transmitter and receiver portions for relative movement with said transmitter and receiver gratings a distance Y apart and in face-to-face complementary relationship in order to establish capacitive coupling between the respective conductive surfaces in said gratings, the relationship of said width dimensions W and W′ of said gratings insuring that said transducer is insensitive to undesired movement of said transmitter and receiver portions in a transverse Z direction, the ratio W′/P being relatively small in order to minimize angular misalignment of the longitudinal axis of said receiver portion relative to said transmitter portion, and the ratio L′/P being relatively large in order to minimize the sensitivity of said transducer to non-uniform separation between said transmitter and receiver portions;

moving means operable to relatively move said transmitter and receiver portions and their associated gratings with respect to one another;

at least one alternating signal generator coupled to alternate conductive surfaces of said transmitter grating;

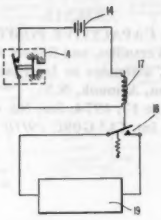
an amplifier circuit having input and output connections and means interconnecting selected conducting surfaces of said receiver grating to the input connections of said amplifier circuit, said amplifier circuit thereby providing output signals indicative of both extent and direction of movement of said transmitter and receiver portions during relative movement.

3,938,114

GAS-POWERED ALARM WITH PRESSURE RESPONSIVE REMOTE INDICATOR CIRCUIT

Joseph T. Sullivan, Huntingdon Valley, Pa., assignor to Standard-Farrington Alarm & Signal Corporation, Trevose, Pa.

Filed Apr. 5, 1974, Ser. No. 458,062
Int. Cl.² G08B 17/02, 17/04
U.S. Cl. 340—227.1 **3 Claims**



1. In a temperature detection and alarm sounding apparatus for physically sounding an alarm at a predetermined alarm temperature comprising:
   a. a cylinder containing freon under pressure;
   b. a horn, activated by freon under pressure; and
   c. a temperature sensitive passage means, isolating said horn from said cylinder when the ambient temperature is below said alarm temperature, and providing a connecting passage between said horn and said cylinder when the ambient temperature attains said alarm temperature,

the improvement wherein said passage means further comprises a pressure conversion means for increasing gas pressure within said passage means, and a pressure sensing means for detecting an increase in the gas pressure within said passage means, and wherein said pressure conversion means comprises a part of said connecting passage adjacent to said horn, said part comprising at least two portions, a first constricted portion located at the end of the part immediately adjacent to said horn, and a second unconstricted portion contiguously located to said first constricted portion, and wherein said pressure sensing means comprises at least one pressure sensitive interior surface of said second unconstricted portion, and wherein said pressure sensing means further comprises a pressure sensitive switch, and wherein said pressure sensing means further comprises an alarm circuit connected to the switch having means for activating remote indicating devices in response to the activation of said switch.

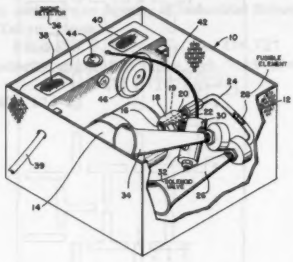
3,938,115 *

COMBINATION SMOKE AND HEAT DETECTOR ALARM

Sidney Jacoby, Philadelphia, Pa., assignor to Evergard Fire Alarm Co., Inc., Philadelphia, Pa.

Filed June 13, 1974, Ser. No. 478,928
Int. Cl.² G08B 17/04, 17/10
U.S. Cl. 340—237 S **12 Claims**

1. In a combination smoke and heat detector alarm, the combination of
   A. a self contained source of energy,
      1. said source including an energy outlet,
      2. said source being compressed gas;
   B. a first conduit system communicating with the outlet,
      1. said first conduit system including a first sounding device, said first sounding device being a gas operated horn,
      2. said first conduit system including first valve means to regulate the flow of energy from the source to the first sounding device,
      3. said first valve means being movable by non-electrical energy from a closed condition to an open condition upon sensing a predetermined high temperature in the vicinity of the alarm; and
   C. a second conduit system communicating with the said outlet,
      1. said second conduit system including a second sounding device, said second sounding device being a gas operated horn,



      2. said second conduit system including second valve means to regulate the flow of energy from the source to the second sounding device,
      3. said second valve means being movable by electrical energy from a closed position to an open position upon sensing a predetermined quantity of smoke in the vicinity of the alarm.

* NOTE: To be issued Feb. 11, 1976.

3,938,116

LEAK DETECTION DEVICE

Helmut L. Schneider, Toronto, Canada, assignor to The Molson Companies Limited, Rexdale, Canada

Filed Aug. 12, 1974, Ser. No. 496,400
Claims priority, application Canada, Apr. 22, 1974, 197942
Int. Cl.² G08B 21/00
U.S. Cl. 340—242 **1 Claim**

1. In combination
   a. a conveyor for conveying containers formed of absorbent material and containing frangible bottles filled with liquid;
   b. a sensor plate, having an upper surface, forming part of the conveyor and arranged in the path of travel of said containers;
   c. a pair of parallel, spaced, copper, sensing bars detachably secured to said upper surface, projecting therefrom and extending normal to said path of travel for sensing the moisture content of the bottom of each said container;
   d. at least one sensing conductor connected to each said bar;
   e. an amplifier and sensitivity control electrically connected to said sensor plate and to
   f. a selector and relay panel which, in turn, is electrically connected to
   g. an alarm and to said conveyor to activate the former and deactivate the latter when said bars detect any moisture emanating from containers passing over said bars.

3,938,117

CRITICAL LIQUID-LEVEL WARNING CIRCUIT

Michael Bozoian, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

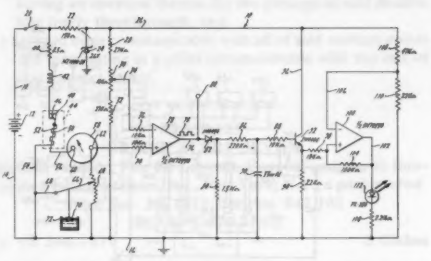
Filed Sept. 20, 1974, Ser. No. 508,018
Int. Cl.² G08B 21/00
U.S. Cl. 340—244 R **11 Claims**

1. A critical liquid-level warning circuit for association with a liquid-level indicating circuit, said indicating circuit including a sensing device which provides a voltage that varies between lower and upper voltage limits as a function of a liquid level sensed by said sensing device, said critical liquid-level warning circuit comprising:

first circuit means, supplied with said sensing device voltage, for generating an electrical signal having one of two conditions depending upon whether said sensing device voltage is below or above a predetermined critical level;

an electrically actuable warning device;

second circuit means for controlling the actuation of said warning device, said second circuit means having an output coupled to said warning device and having an input responsive to a predetermined voltage level to cause said output to actuate said warning device; and



a delay circuit, coupled to the output of said first circuit means and to the input of said second circuit means, said delay circuit producing a voltage signal which varies in magnitude as a function of time elapsed subsequent to the change of said electrical signal generated by said first circuit means from one of said two conditions to the other of said two conditions, said second circuit means actuating said warning device when said variable voltage signal reaches a predetermined level.

3,938,118

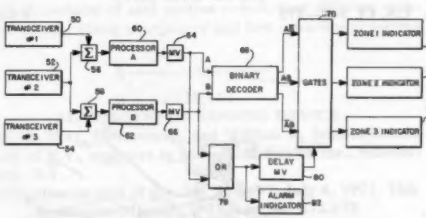
MULTIZONE INTRUSION ALARM SYSTEM

Aaron A. Galvin, Lexington, and L. Dennis Shapiro, Lincoln, both of Mass., assignors to American District Telegraph Company, New York, N.Y.

Filed June 12, 1974, Ser. No. 478,526

Int. Cl.² G08B *13/24, 13/16*

U.S. Cl. 340—258 R **6 Claims**



1. A multiple zone intrusion alarm system comprising:

a plurality of transmitting and receiving means each disposed in a respective zone under protection and each including means for propagating a signal in said zone and means for receiving signals returned from said zone and from objects therein;

means for selectively combining said returned signals to provide a plurality of differently combined signal versions thereof, said signal versions being less in number than the number of zones being protected;

a plurality of signal processors of a lesser number than the number of zones under protection and each operative to discriminate between an actual intruder and spurious signal conditions, each signal processor receiving a respective one of said signal versions and providing an output signal in response thereto; and

decoder means operative in response to said output signals from said signal processors to provide a plurality of signals each corresponding to a respective protected zone and each representative of intruder presence in said zone.

3,938,119

ELECTRO-MECHANICAL THREAD SUPERVISORY APPARATUS

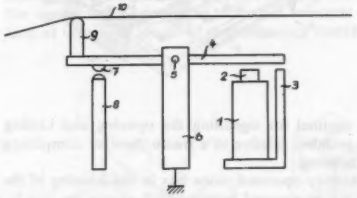
Hermann Schwartz, Pfaffikon, Switzerland, assignor to Siegfried Peyer, Bach, Switzerland

Filed May 5, 1975, Ser. No. 574,399

Claims priority, application Switzerland, June 20, 1974, 8469/74

Int. Cl.² G08B *21/00*

U.S. Cl. 340—259 **10 Claims**



1. Electro-mechanical thread supervisory apparatus having a deflectable mechanical arm (4) in contact with the thread (9) being supervised and deflected by pressure by the thread on the arm, comprising

electromagnetic means (1, 2, 3) acting on the arm in a direction counter the direction of pressure force exerted on the arm (4) by the thread (9), said arm being magnetically responsive to said electromagnetic means, said electromagnetic means being pulse-energized to cause the arm to vibrate;

arm movement sensing means (7, 8) connected to a source of electrical power (23, 23′) and controlled by deflection of the arm due to pressure of the thread on the arm and generating pulses upon vibration of the arm (4);

and electrical detection means (15, 16, 17, 18; 37, 38, 39, 18′) connected to and responsive to the generated electrical pulses and providing an alarm signal upon failure to sense vibration of the arm and thus generate pulses indicative of: (a) absence of thread; or (b) excessive thread tension; or (c) jamming of movement of the arm.

10. Method to supervise supply of a filament at a predetermined tension at a supervisory location by a supervisory apparatus, and additionally supervise operation of said apparatus, said method comprising: generating a thread presence force of a first magnitude, by engaging the thread;

generating a counteracting electromagnetic force, in recurring pulses, which is larger than said thread presence force;

balancing said forces against each other and generating a resulting output signal, said output signal being interrupted when the thread presence force counteracts the pulsed electromagnetically generated force during pulse gaps, but becoming a constant signal upon the absence of said thread presence force during said pulse gaps;

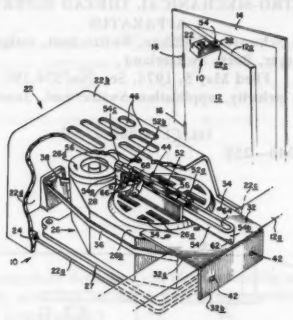
and testing if the sensed signal is an interrupted signal or a constant signal, and providing an alarm output if the signal is not an interrupted signal.

3,938,120

TALKING DOOR SENTINEL

Gerard O'Connell, Holyoke, Mass., assignor to Baltimore Brushes, Inc., Boston, Mass.

Filed May 6, 1974, Ser. No. 467,297
Int. Cl.² G08B *13/08;* **H04M** *11/04*
U.S. Cl. 340—274 R **7 Claims**



1. A sentinel for signalling the opening and closing of a closure member relative to a frame therefor comprising:

A. a housing;

B. a battery operated voice box in the housing of the type having an exposed button which causes the box to cycle through one playback operation when the button is depressed momentarily and to cycle repetitively as long as the button is depressed;

C. means for mounting the housing near an edge of the member;

D. a trigger mounted adjacent the voice box button, said trigger

1. being movable between the first and second positions;

2. having one portion which engages the frame when the member is closed so as to move the trigger to its first position; and

3. having another portion which engages and momentarily depresses the voice box button when the trigger is moved to one of its two positions so that the box cycles through only one playback operation and emits an audible message at the vicinity of the closure member;

E. means for resetting the trigger when the member is moved to its other position so that the box will cycle through another playback operation when the member is moved again to its said one position.

3,938,121

ELECTRICAL WIRING AND ALARM SYSTEM

Fred W. Jamison, 215 E. Palm Ave., Apt 411, Tampa, Fla. 33602

Filed Aug. 7, 1974, Ser. No. 495,322
Int. Cl.² G08B *13/08*
U.S. Cl. 340—274 R **11 Claims**

1. In an electrical wiring and alarm system at a premises to be protected, said system having:

one or more receptacles, each having a common terminal and first and second supply terminals insulated from each other and from said common terminal and arranged so that one plug can be plugged into said first and common terminals and another plug can be concurrently plugged into said second and common terminals;

a first line conductor connected to said first supply terminals and connected to one side of a current supply;

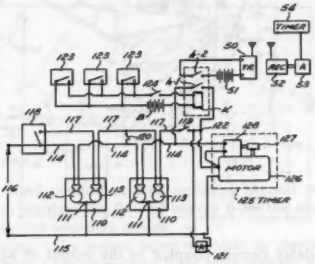
a second line conductor connected to said common supply terminals and connected to the other side of said current supply;

a third line conductor connected to said second supply terminals;

and a wall switch connected between said first and third line conductors and operable when closed to connect said third line conductor to said one side of the current supply for turning on lights which are plugged into said second and common terminals of said one or more receptacles;

the improvement which comprises;

alarm switch means and first selector switch means connected by circuit means in series with each other between said first line conductor and said second supply terminals



of the receptacles, whereby the opening of said first selector switch means disconnects said alarm switch means from said second supply terminals, said circuit means having a junction between said alarm switch means and said first selector switch means;

alarm signalling means operatively connected to said junction to be activated in response to the closing of said alarm switch means;

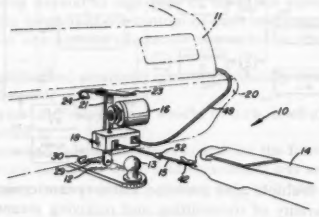
and second selector switch means connected in said circuit means for controlling the connection of said alarm switch means to said alarm signalling means.

3,938,122

GUIDANCE DEVICE

Jack E. Mangus, 456 Broadview Road, Tallmadge, Ohio 44278

Filed Nov. 15, 1974, Ser. No. 524,223
Int. Cl.² B62D *53/00*
U.S. Cl. 340—275 **6 Claims**



1. A guidance device activated by a power source to aid an operator in the alignment of a first and a second object at least one of which is movable with respect to the other comprising:

a flexible line connectible between desired points on said first and second objects;

means mounted on said first object for drawing in said line as said first object moves toward said second object;

sensing means for detecting changes in the alignment of said desired points; and,

indicating means for signalling said changes to the operator whereby alignment may be determined and maintained during movement of said first object toward said second object wherein said sensing means includes:

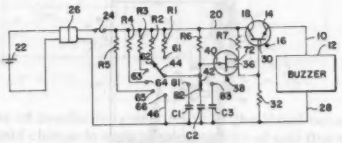
a frame;
a switching element in electrical contact with one pole of the power source;
means for pivotally mounting said element on said frame; and,
at least three contact points carried by said frame and in electrical contact with the other pole of said power source; and, wherein said switching element includes;
an elongated slot through which a rivet passes to guide reciprocable movement of said element on said frame;
at least one gate extending outwardly from said element and having an aperture therein for the passage of said flexible line freely therethrough; and,
a forward edge communicable with all of said contact points and terminating in a point communicable with any one of said contact points.

3,938,123

DRIVER ALERT DEVICE

Glenfield Warner, Ville St. Laurent, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Jan. 20, 1975, Ser. No. 542,102
Int. Cl.² G08B 21/00
U.S. Cl. 340—279 **5 Claims**



1. An alarm system for keeping alert a motor vehicle operator which comprises: an alarm, a motion switch responsive to movements of the vehicle operator, and which switch includes a plurality of contacts disposed for random contact with a pendant, and means for periodically initiating and terminating operation of said alarm responsive to the position of said motion switch, said means for initiating and terminating including a first capacitor which is charged by an electric current passed through said pendent, a plurality of resistors of different value which are respectively connected to said plurality of contacts of said motion switch, said different resistance values causing charging of said first capacitor at varying rates.

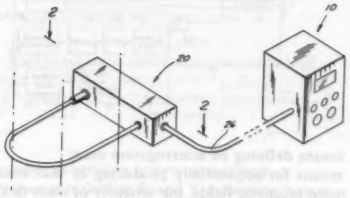
3,938,124

ALARM SYSTEM SENSING DEVICE

Blaine A. Way, Schenectady, and William R. Scholtz, Scotia, both of N.Y., assignors to Salient Electronics, Inc., Schenectady, N.Y.

Continuation-in-part of Ser. No. 159,697, July 6, 1971. This application May 23, 1974, Ser. No. 472,615
Int. Cl.² G08B 21/00
U.S. Cl. 340—280 **3 Claims**

1. An alarm system sensing device attachment for use with alarm systems instruments and detector systems which monitor the stability of energy forms transmitted between remote locations comprising:
a housing having within a secure enclosed chamber, said chamber containing a number of connecting devices protectively recessed within and extending to and through the outer surface of the housing;
a flexible cable component containing within one or more conductive energy paths, said cable originating from within the interior of the protective housing and thereafter passing to a physical location outside of said housing, thereafter extending without interruption for a certain distance outside of the housing and ultimately terminating within said same housing, the final termination being accomplished by means of suitable recessed connector component devices;
the internal conductive energy transmission paths being completely concealed and protectively enclosed by the housing and the body of the connecting device components to provide the physical condition of self-protection and freedom from tampering and so as to establish a condition whereby the partial physical separation of the joined connector device components causes an interruption of the energy paths within prior to the time when a further physical connector component separation actually exposes to view those elements which comprise portions of said energy paths;
the connection devices being capable of simultaneously providing both the junction of energy transmission paths, and mechanical interconnections of adequate strength to resist accidental separation of the associated mating connector components;
said housing, said connecting devices, and said external cable component, providing a physical design wherein the housing itself and the external cable join together through the connecting devices so as to form in concernt a closed loop of invariable length of circumference thereby allowing the loop so established to encircle and thereby become securely attached to the narrow portion of an irregularly shaped object without the necessity of having any portion of the attachment device pass through openings or other apertures in the object itself;



means on the housing for communication with alarm system detection instruments located remotely;
the connector components, conduits, cables, and conductive paths being interconnected with the housing so that energy supplied to the device will establish pathways within the external cable portion and through portions of the interior area of the housing;
means permitting the device to be made compatible with detection instruments of desired form of transmitted energy; and
the several mechanical and energy conductive components of the device being interrelated so as to assure that the attempted enlargement of the established fixed circumference of the closed attachment loop will result in the interruption of alteration of the normal pattern of energy preestablished within said loop components thereby providing a means whereby the physical act of said loop enlargement may be remotely detected by instruments.

3,938,125

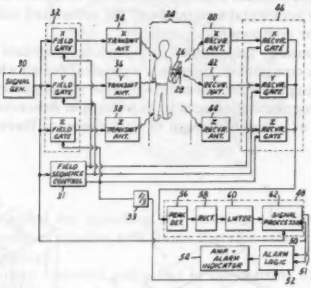
ANTIPILFERAGE SYSTEM AND MARKER THEREFOR

Dominic A. Benassi, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 20, 1974, Ser. No. 443,954
Int. Cl.² G08B 13/24
U.S. Cl. 340—280 **8 Claims**

1. A system for detecting the presence of an object within an interrogation zone comprising:
a. a marker carried by said object, which marker comprises a sheet including a laminate of a ferromagnetic layer and an electrically conductive layer wherein said ferromag-

netic layer is characterized by an initial relative permeability in excess of 20,000, a maximum relative permeability in excess of 100,000 and a coercivity less than 0.3 σe such that said sheet is capable of responding to a magnetic field having a major field component in one direction in an interrogation zone, which field varies at a predetermined rate of not less than 1 KHz, to cyclically enhance said field in the zone and wherein said electrically conductive layer is characterized by a resistivity of not greater than about 3.0 microhm-cm such that said sheet is capable of responding to another cyclical magnetic field having a major field component in a direction substantially normal to said one direction to diminish said another field in the zone;



b. means defining an interrogation zone;

c. means for sequentially producing in said zone at least three magnetic fields, the intensity of each field periodically varying at a predetermined rate of not less than 1 KHz, a major field component of each field within said zone being orthogonally disposed with respect to a major field component of the other two fields; and

d. means for detecting in the vicinity of the interrogation zone a change in the magnetic field condition due to the presence of a marker in the zone resulting in a signal corresponding to said enhancement and diminishment occurring during at least two of said three produced sequential fields irrespective of the orientation of said marker within said zone.

3,938,126

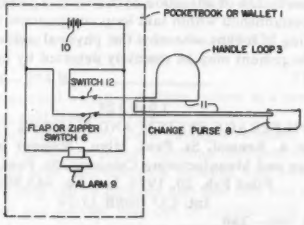
HANDBAG ALARM SYSTEM

Mary Ransom, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Nov. 7, 1974, Ser. No. 521,676

Int. Cl.[2] G08B *13/08, 13/12*

U.S. Cl. 340—280 **3 Claims**



1. A handbag alarm system for a handbag having a handle, an opening, closing means for selectively closing the opening, and a change purse stored in the handbag, said alarm system comprising

an audible alarm in the handbag;

battery means in the handbag electrically connected to the alarm for energizing the alarm to produce an audible signal; and

a short-circuiting electrical conductor electrically connected in shunt across the battery means and extending through the handle and closing means of the handbag whereby the short-circuiting short-circuits the battery means and prevents energizing of the alarm and when the short-circuiting conductor is opened anywhere along its length it fails to short-circuit the alarm and the alarm is energized.

3,938,127

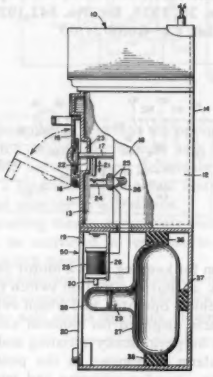
ALARM DEVICE

Michael A. Tabet, Norfolk, Va., assignor to Hughes D. Burton, Norfolk, Va., a part interest

Filed July 22, 1974, Ser. No. 490,743

Int. Cl.[2] G08B *25/00*

U.S. Cl. 340—304 **6 Claims**



1. An apparatus for initiating an alarm and assisting in the identification of the person initiating the alarm comprising an alarm signalling means, movable means for initiating the signalling means, an evacuated container adapted to be opened to the atmosphere, and means responsive to movement of the movable means for opening the container, said container being disposed where air about the said movable means is drawn into the container when the container is opened, said air carrying the characteristic scent of the person initiating the alarm.

3,938,128

WARNING CIRCUIT FOR INDICATING THAT AN INTERMITTENTLY OPERATED DEVICE HAS BEEN OPERATED FOR A PREDETERMINED CUMULATIVE LENGTH OF TIME

Richard A. Pidsosny, Detroit, and John Zimmer, Ann Arbor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 12, 1974, Ser. No. 523,088

Int. Cl.[2] G08B *1/00;* **G04F** *10/00*

U.S. Cl. 340—309.1 **10 Claims**

1. A warning circuit for indicating that an intermittently operated device has been operated for a predetermined cumulative length of time, said warning circuit comprising:

a coulometer having first and second electrodes and an active material capable of being transferred from said first electrode to said second electrode, said coulometer having an impedance after all of said active material is transferred to said second electrode that is substantially

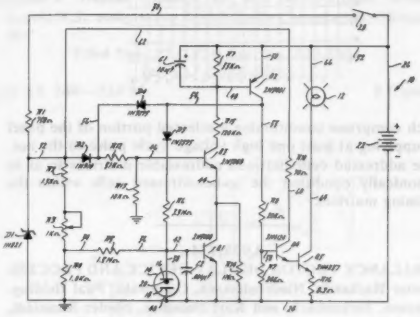
higher than its impedance when said active material is on both of said electrodes;

means for causing the transfer of said active material from said first electrode to said second electrode of said coulometer when said intermittently operated device is in operation;

means for providing a warning;

a first transistor coupled to said coulometer, said first transistor changing in its state of conductivity when said higher-impedance condition of said coulometer occurs;

a second transistor coupled to said first transistor, said second transistor being placed in and maintained in a



state of conductivity as a result of the initial occurrence of said change in state of conductivity of said first transistor, said second transistor when in said maintained state of conductivity supplying current to said coulometer to maintain it in its higher impedance condition;

circuit means for controlling said warning means, said circuit means permitting said warning means to provide a warning indication only when said device is in operation and said second transistor is in said maintained state of conductivity, whereby, said warning indication may be used to indicate the elapse of said predetermined cumulative length of time.

3,938,129

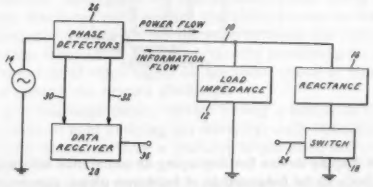
POWER LINE DATA TRANSMISSION SYSTEM

Miles A. Smither, Harris, Tex., assignor to General Electric Company, Fairfield, Conn.

Filed Aug. 21, 1974, Ser. No. 499,363

Int. Cl.² H04M *11/04*

U.S. Cl. 340—310 R **13 Claims**



1. A method of transmitting data over a line carrying alternating current power, comprising the steps of:

varying the phase angle between the voltage and the current of the line between a first and a second predetermined value in response to a data signal to be transmitted, said first phase angle value representing a first signal condition, said second phase angle value representing a second signal condition;

detecting the phase angle between the voltage and the current on said line; and

providing a first signal in response to detecting said first predetermined value of phase angle and a second signal in response to detecting said second predetermined value of phase angle.

3,938,130

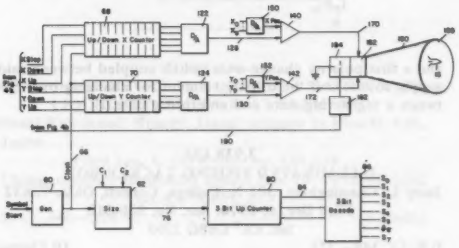
DIRECTION CODED DIGITAL STROKE GENERATOR PROVIDING A PLURALITY OF SYMBOLS

Gerald O. Burnham, Los Angeles, and John W. Weber, Inglewood, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 229,231, Feb. 25, 1972, abandoned. This application Aug. 6, 1973, Ser. No. 385,919

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 A **2 Claims**



1. A symbol generating system comprising:

display means including X and Y deflecting means;

X and Y up and down counters coupled to said X and Y deflecting means to develop a plurality of line segments;

a source of direction commands for each segment for selectively controlling each of said X and Y counters to count up, count down or to stop;

decoding means coupled to said X and Y counters and responsive to said source of direction commands to develop X and Y count up, count down and stop signals to control said respective X and Y counters so that said plurality of line segments after a first segment each start at the termination of the previous segment;

a source of clock signals for providing clock signals of a fixed frequency coupled to said X and Y up and down counters;

a source of segment length commands; and segment length control means responsive to said source of segment length commands including frequency divider means coupled between said source of clock signals and said decoding means to control the time of passing of the direction commands for each segment by said decoding means to said X and Y up and down counters to determine the length of said line segments.

3,938,131

ENERGIZING CIRCUIT FOR A VISUAL DISPLAY ELEMENT

Rudolf Alexander Van Doorn, and Pieter Tammo Bolwijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 3, 1974, Ser. No. 511,662

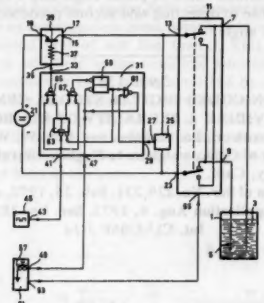
Claims priority, application Netherlands, Oct. 11, 1973, 7313982

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 R **5 Claims**

1. An energizing circuit for a visual display element having energizing electrodes, comprising a liquid situated between said energizing electrodes, said liquid comprising a redox pair with one component being insoluble, a power supply source

coupled to said energizing electrodes capable of being disconnected; a threshold circuit having an output for controlling the power supplied to the display element by said supply source;



and a first polarity change-over switch coupled between said supply source and the display element for changing over between a registering state and an erasing state.

3,938,132

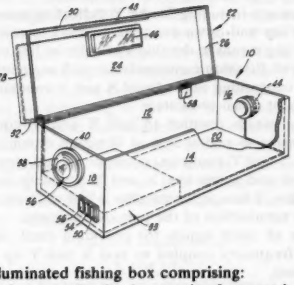
ILLUMINATED FISHING TACKLE BOX

Jerry L. Cunningham, 301 N. College, Cordell, Okla. 73632

Filed Dec. 6, 1974, Ser. No. 530,218

Int. Cl.² G08G *3/00*

U.S. Cl. 340—321 **10 Claims**



1. An illuminated fishing box comprising:

a hollow base portion having a pair of opposed end walls;

a lid hingedly connected to one side of the base portion; and

a light movably mounted in one of said end walls for manual movement to varying positions in said one end wall to direct light downwardly or outwardly from the fishing box.

3,938,133

CONDITIONING OF GAS DISCHARGE DISPLAY/MEMORY DEVICE

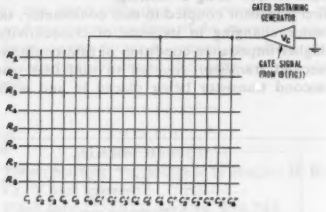
John W. V. Miller, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Dec. 3, 1971, Ser. No. 204,466

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 M **8 Claims**

1. In a process for conditioning multiple gas discharge display/memory panel, having a relatively large geometrical area, and containing an ionizable gaseous medium and having a plurality of discharge cells formed by a pair of transversely related electrodes, said discharge cells being geometrically arranged in rows and columns and the panel being electrically addressable in a plurality of matrices for displaying alphanumeric characters formed by selected rows and columns of addressable discharge cells, each addressable matrix within said panel having a relative size of C by R discharge cells with a spacing between adjacent addressable matrices of at least one column or one row of not-to-be addressed discharge cells and a series of panel border discharge cells being maintained in the one state to constitute pilot cells, the improvement



which comprises conditioning a selected portion of the panel by supplying at least one high voltage cycle pulse to the not-to-be addressed cells between addressable matrices so as to photonically condition the to-beaddressed cells within the adjoining matrices.

3,938,134

UNBALANCE VECTOR DISPLAY DEVICE AND PROCESS

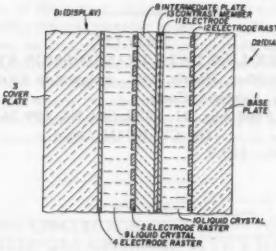
Guenter Hackstein, Niedernhausen, Odenwald; Paul Holdinghausen, Bickenbach, and Karl Homilius, Nieder-Ramstadt, all of Germany, assignors to Carl Schenck AG, Darmstadt, Germany

Filed Aug. 30, 1974, Ser. No. 501,884

Claims priority, application Germany, Sept. 5, 1973, 2344622

Int. Cl.² G08B *5/36*

U.S. Cl. 340—324 M **12 Claims**



1. A display device for displaying an unbalance information for a body to be balanced in at least one plane, comprising a liquid crystal display panel, transparent dial means superimposed upon said liquid crystal display panel, means holding said liquid crystal display panel and said transparent dial means in an operational relationship to each other, said liquid crystal display panel comprising row electrodes and column electrodes each including respective row electrode elements and column electrode elements, said electrode elements having different configurations, said row electrodes further comprising first means for conductively interconnecting elements of the same configuration to form a plurality of rows, said

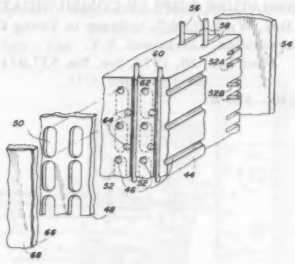
column electrodes further comprising second means for conductively interconnecting elements of the same configuration to form a plurality of columns, said rows and columns being arranged so that elements of the same configuration are in register with each other and so that an element of one configuration alternates with an element of another configuration in the physical distribution of said electrode elements in said liquid crystal display panel.

3,938,135

GAS DISCHARGE DISPLAY DEVICE AND AN IMPROVED CELL THEREFOR

Michael C. DeJule, Chicago, Ill., and David Glaser, Greenbrook, N.J., assignors to Zenith Radio Corporation, Chicago, Ill.

Filed Nov. 27, 1974, Ser. No. 527,568
Int. Cl.² G08B 5/36
U.S. Cl. 340—324 M **8 Claims**



1. For use in a display device having a matrix of rows and columns of light emitting gas discharge cells, an improved gas discharge cell comprising:
enclosure means defining a gas-filled cell cavity;
cathode means disposed near the rear of the cavity and adapted to receive an electrical voltage;
a video anode situated in the front end of the cavity, the space in the cavity between the video anode and the cathode constituting a main discharge path; and
a priming anode adapted to receive a priming voltage which is positive with respect to the cathode voltage, said priming anode extending along a substantial part of the main discharge path between the video anode and the cathode so that, when the priming voltage is applied to the priming anode, a part of the priming anode nearest the cathode establishes a priming discharge in the cavity between the cathode and the priming anode, which discharge is progressively propagated by the priming anode along the main discharge path toward the video anode so that a substantial portion of the distance between the cathode and the video anode is primed, thereby permitting the use of a low level video signal on the video anode to sustain and control the primed discharge.

6. A gas discharge display device having a matrix of rows and columns of light emitting gas discharge cells comprising:
enclosure means defining a plurality of gas-filled cell cavities;
cathode means and anode means disposed across said cavities and near opposite ends thereof for sustaining a gas discharge therebetween; and
a flat, transparent glass plate comprising a part of said enclosure means through which the cells are viewed and having a transparent conductive film and a side of the plate opposite the cavities, said film comprising one plate of a capacitor for receiving a periodic priming pulse for establishing an automatically decaying electric field between said plate and the cathode means so as to induce a gas discharge therebetween and to permit the continuation of the discharge by a voltage applied to the anode means that is less than required to initiate a discharge.

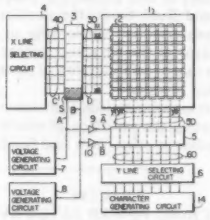
8. A gas discharge device comprising:
a matrix of rows and columns of gas-filled discharge cells;
an array of electrodes in the device arranged in the following order from the back to the front of the device:
cathode means;
scan anode means for establishing a scanning discharge between itself and the cathode means;
video anode means for receiving an information-bearing signal; and
a flat transparent glass plate covering each cell cavity and having a transparent conductive film thereon, said film acting as one plate of a capacitor and being adapted to receive a periodic priming pulse for establishing an electric field between itself and the cathode means so as to induce a brief gas discharge therebetween and permit the video anode means to sustain the discharge with a relatively low voltage signal.

3,938,136

METHOD AND DEVICE FOR DRIVING A MATRIX TYPE LIQUID CRYSTAL DISPLAY ELEMENT

Hideaki Kawakami, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Jan. 4, 1974, Ser. No. 430,919
Claims priority, application Japan, Jan. 10, 1973, 48-5182
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **5 Claims**

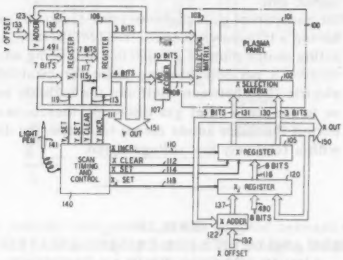


1. A method for driving a matrix type liquid crystal display element driven by the predetermined number of X lines and the predetermined number of Y lines, comprising the step of applying to a non-selected X line an alternating voltage $\mp 1/6V_0$ of one-sixth times as great as a voltage V_0 required for rendering the liquid crystal opaque, the step of applying to a non-selected Y line an alternating voltage $\pm 1/6V_0$ opposite in phase to the alternating voltage applied to the non-selected X line, the step of applying to a selected X line an alternating voltage $\pm \frac{1}{2}V_0$ opposite in phase to the alternating voltage applied to the non-selected X line, and the step of applying to a selected Y line an alternating voltage $\mp \frac{1}{2}V_0$ opposite in phase to the alternating voltage applied to the selected X line, whereby an alternating voltage of $\pm V_0$ is applied to a selected dot at an intersection of the selected X and Y lines to render the selected dot opaque, and an alternating voltage having an absolute amplitude value of $\frac{1}{3}$ V_0 is applied to the dots other than said selected dot to prevent cross talk between the X and Y lines.

3,938,137
PLASMA PANEL LIGHT PEN TRACKING USING ADAPTIVE TRACKING SCAN

Peter Dinh-Tuan Ngo, Colts Neck, and William Herbert Ninke, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 21, 1974, Ser. No. 472,075
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **11 Claims**



1. Apparatus for detecting a moving light sensor over a plasma panel display surface having a plurality of plasma cells located at respective display sites, selected ones of said plurality of cells being periodically activated, thereby to emit light pulses at periodic intervals and at a fixed time in each such interval, comprising

first means for sequentially activating at least selected ones of said plurality of plasma cells at times different from said fixed times,

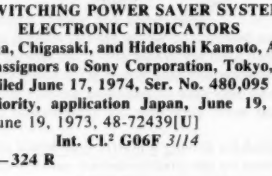
second means for sequentially activating at least selected ones of a subset of said plurality of plasma cells at times other than said fixed times, the position of said subset having a predetermined relationship to the position of said light sensor at the time said sensor last detected a light pulse at one of said plurality of plasma cells at other than said fixed time, and

output means responsive to said light sensor for generating signals indicating the positions at which said sensor detects light pulses at other than said fixed times.

3,938,138
TIME SWITCHING POWER SAVER SYSTEM FOR ELECTRONIC INDICATORS

Koichi Kojima, Chigasaki, and Hidetoshi Kamoto, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 17, 1974, Ser. No. 480,095
Claims priority, application Japan, June 19, 1973, 48-72438[U]; June 19, 1973, 48-72439[U]
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 R **5 Claims**



1. A time switching power saver circuit for a battery powered electronic indicator comprising:

A. An indicator for displaying figures connected to be supplied with a DC power supply voltage by a battery;

B. control means having an indicator instruction signal input, said means effective to control a time switching means in accordance with the state of an induced instruction time signal;

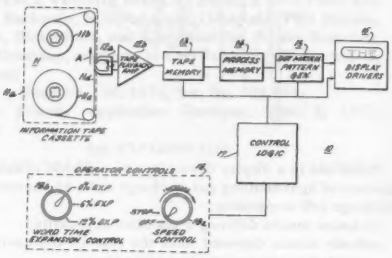
C. switching means connectedd to said control means, said time switching means generating in response to said instruction signal a switching signal; and

D. indication control means connected between said time switching means and said indicator for receiving said switching signal to control the indication of the latter, said indication control means being responsive to said switching signal for controlling the indicator to first make a continuous indication for a predetermined time period in response to the indication signal and to later automatically make an intermittent indication also in response to said switching signal.

3,938,139
MINIATURE DISPLAY COMMUNICATOR

Leslie R. Day, Wyckoff, N.J., assignor to Young Communications Corporation, Larchmont, N.Y.

Filed Dec. 30, 1974, Ser. No. 537,071
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 R **4 Claims**



1. A portable hand-held device for displaying textual material in a single line position comprising:

removable first storage means for storing binary coded data representative of textual information;

said device having means for receiving said first storage means;

a first memory adapted to store a predetermined block of textual information in binary form;

reader means being selectively actuated for transferring a block of data from said first storage means to said first memory;

logic means responsive to the presence of each end of block code interspersed in said first storage means to deactivate said reader means;

second memory means for storing a block of textual information in binary form;

transfer means for transferring the contents of said first memory to said second memory responsive to the sensing of an end of block code by said logic means;

second means responsive to the transfer of an end of block code into said second memory means for deactivating said transfer means;

a multi-bit register means;

means responsive to completion of the transfer of data into said second memory means for transferring binary coded words into said register means in sequential fashion;

character generator means for converting the binary coded word in said register means into an M × N dot matrix pattern comprised of M dot columns of N dots per column, wherein each pattern forms a character associated with a predetermined binary code;

display means comprising a dot matrix of a P × N dot matrix of light emitting devices comprised of P columns of N dots per column, where P = K(M+2) and K is a real integer greater than 1;

N shift register means each associated with a row of said P × N matrix of light emitting devices;

means for transferring each dot column pattern generated by said character generator means into the input stages of said N shift registers in a sequential dot column by dot column fashion;

means responsive to the word length of at least one of the words loaded into said N shift registers for controlling the interval of time during which the said last word is illuminated.

3,938,140

DATA DISPLAY DEVICE

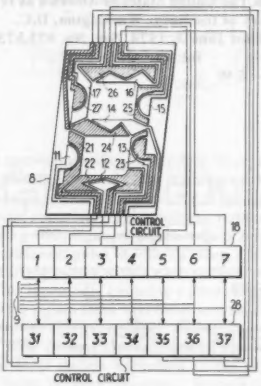
Jean Garcia; Michel Hareng, and Eugene Leiba, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 6, 1974, Ser. No. 467,562

Claims priority, application France, May 9, 1973, 73.16737

Int. Cl.² G08B *5/36*

U.S. Cl. 340—336 **9 Claims**



1. A data display device comprising at least one segment whose shape has a descriptive value, said shape undergoing a perceptible change in appearance under the action of a control signal applied to means for exciting said segment, wherein each said segment comprises a same number of complementary areas; said excitation means being divided up into as many excitation units as there are areas in each said segment; said units being electrically connected to said areas by separate connections and being controlled simultaneously by said control signal.

3,938,141

SNAP-ON HOUSING ADAPTED FOR PANEL MOUNTING OF TRANSDUCER

Jacob Neuhof, Bridgeport, Conn., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 6, 1975, Ser. No. 538,995

Int. Cl.² G08B *3/00*

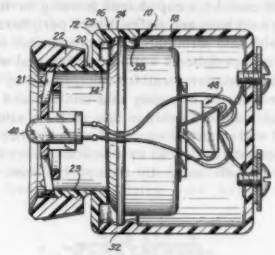
U.S. Cl. 340—384 R **9 Claims**

1. A housing for an electrical component, said component having a flange-like portion at its periphery, comprising:

a cover having a series of resilient axially extending, spaced fingers or tabs at the periphery thereof;

each of said fingers having a convex leading portion and an abutting groove at its inner surface, the grooves together receiving the flange-like portion at the periphery of the electrical component;

a back-end bracket having a like series of resilient axially extending, spaced fingers, as defined above, which likewise receive the flange-like portion at the periphery of



said component and which fit between the fingers on said cover such that a complete housing is provided and said component is firmly retained inside said housing.

3,938,142

ULTRASONIC TRANSMITTER FOR THE REMOTE CONTROL OF RADIO AND TELEVISION RECEIVERS

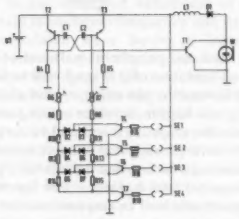
Wolfgang Schröder, Pforzheim, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 29, 1974, Ser. No. 474,455

Claims priority, application Germany, June 12, 1973, 2329740

Int. Cl.² G08B *3/00*

U.S. Cl. 340—388 **9 Claims**



1. An ultrasonic frequency transmitter for remote control devices, comprising:

an electrostatic transducer;

a source of d.c. voltage connected in parallel with the electrostatic transducer;

a controllable electronic switch connected across said electrostatic transducer for periodically shorting said transducer; and

an a.c. voltage generator connected to said electronic switch for controlling said switch so that said transducer transmits a desired ultrasonic frequency.

3,938,143

BUZZER

Arthur J. Little, Springfield, and William R. Mayer, Rochester, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

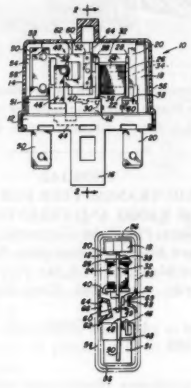
Division of Ser. No. 191,861, Oct. 22, 1971, Pat. No. 3,768,158. This application May 7, 1973, Ser. No. 357,551

Int. Cl.² G01K *1/08;* **G10K** *1/00*

U.S. Cl. 340—402 **4 Claims**

1. A buzzer comprising a molded insulated base carrying a pair of electrical terminals spaced longitudinally relative said base and extending through the base, a coil having ends, a bobbin carrying said coil and having a pair of spaced lugs with

a coil end wrapped around each lug, a contact member spaced intermediate said terminals carrying a contact at one end with the other end of said member fixed in said base, an armature fixed to one terminal and biased in one direction into engagement with said contact, a cup-shaped housing having an open end receiving said base and defined by a peripheral wall and a back wall with said terminals, contact member and bobbin encircled by said peripheral wall, a first integral wall spaced inwardly of said peripheral wall for engagement by said armature in a direction for engaging said contact and extending from said back wall to a position spaced from said base, another integral wall spaced inwardly of said peripheral wall and extending from said back wall to a position spaced from said base, a pair of walls integrally formed between said other



inwardly spaced wall and peripheral wall and of substantially the same length as said inwardly spaced wall to form a cavity, a core integrally formed on the other of said electrical terminals and carrying said bobbin, a solder coating on each end of said coil to secure the respective coil end to a respective lug, a finger integrally formed with said contact member and having a slot for receiving one lug, and a finger integrally formed on said other terminal and having a slot for receiving said other lug to support said coil in response to the deformation of said fingers against a respective lug and establish an electrical connection from said other terminal through said coil and contact member to said armature and one terminal for energizing said coil to move said armature from said contact to deenergize said coil, whereafter said biased armature reengages said contact and said first wall.

3,938,144

DIGITAL MULTIPLEXING SYSTEM REMOTE SCANNING OF A PLURALITY OF MONITORING POINTS

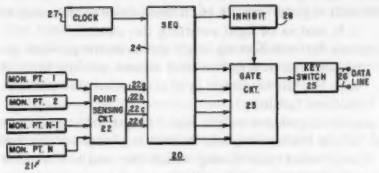
Carl N. Pederson, Westmont, and Peter G. Angelopoulos, Elmhurst, both of Ill., assignors to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 28, 1973, Ser. No. 419,714

Int. Cl.[2] G08B *19/00*

U.S. Cl. 340—413 **24 Claims**

1. In a multiplexed data transmission system for transmitting data over a transmission line from a first location to a second location, sender means at said first location including first means for generating a serial pulse train including a start pulse followed by a plurality of data pulses during each of a plurality of time frames, second means for transmitting pulse trains provided by said first means to said second location over said transmission line, and inhibit means for inhibiting the transmission of pulse trains during alternate time frames, and receiver means at said second location including means for receiving said pulse train, data storage means, and sequencing means including clock pulse generating means responsive to the start pulse to provide a plurality of clock pulses having a



predetermined relation to said start pulse for enabling said data pulses to be gated into said data storage means.

3,938,145

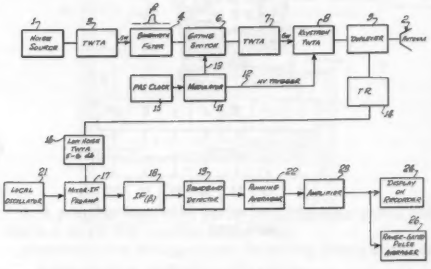
FAST-SCANNING BROAD BAND RADAR SYSTEM

Marx Brook, and Paul R. Krehbeil, both of Socorro, N. Mex., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 3, 1974, Ser. No. 475,673

Int. Cl.[2] G01S *9/60*

U.S. Cl. 343—5 W **6 Claims**



1. A radar system for providing the mean reflected power of return signals derived from randomly-arranged constantly-changing clutter type targets, comprising:

a noise source,

means coupled to said noise source for producing a series of noise signal output pulses each having a predetermined bandwidth centered on a predetermined frequency and each having a predetermined pulse length,

transmitting means coupled to said series output for driveably transmitting each of said output pulses in a single undivided form into said clutter type targets, said bandwidth and pulse length being predetermined to assure the inclusion of a plural number of individual uncorrelated electrical field noise configurations in each of said single transmitted pulses,

receiver means matched to said bandwidth for receiving said return signals, and

return signal processing means including:

means for integrating the reflected power of each of said return signals over the full pulse length period of each of said single transmitted pulses whereby the reflected power of each return signal is averaged for all of said individual configurations to produce a mean intensity value for said reflected power, and

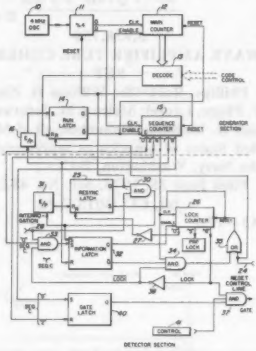
indicator means for providing said mean intensity value.

3,938,146

SECURE ENCODER FOR TRILATERALIZATION LOCATOR UTILIZING VERY NARROW ACCEPTANCE PERIODS

Paul K. Dano, Euless, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Filed Apr. 1, 1974, Ser. No. 457,145
Int. Cl.² G01S 9/56
U.S. Cl. 343—6.5 LC **7 Claims**



1. A radar station identification system wherein said system comprises a plurality of local radar stations, each of said local stations comprising means for receiving from another of said stations a train containing an indefinite number of successively occurring interrogation pulses which might have any one of many different pulse repetition rates, a local source of cyclically recurring pulses within each station, means at each local station for repeatedly counting a predetermined number of said recurring pulses from said local source, means at each of said local stations for successively defining a series of repetitive narrow time of acceptance periods which individually identifies that local station according to the repetition rate, said periods being defined responsive to each completion of said count of said predetermined number of pulses, means at each local station responsive to each train of interrogation pulses for responding to any one pulse in the indefinite number of pulses and thereafter detecting as they are received a plurality of each cyclically recurring interrogation signals appearing within said times of acceptance that identifies the local station, means at each local station for rejecting as they are received interrogation signals appearing outside of said times of acceptance which individually identifies that particular local station, and decoder means for identifying the interrogation signals addressed to said local radar stations responsive to the repetition rate of a succession of said cyclically accepted interrogation signals, whereby each of said plurality of local radar stations responds individually to only those of the received interrogation signals having the repetition rate which is addressed to the responding station.

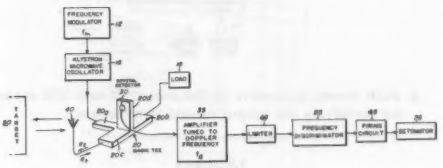
3,938,147

FREQUENCY MODULATED DOPPLER DISTANCE MEASURING SYSTEM

Henry P. Kalmus, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 19, 1959, Ser. No. 814,351
Int. Cl.² G01S 9/24; F42C 13/04
U.S. Cl. 343—7 PF **4 Claims**

4. A single antenna missile fuzing system adapted to function at a predetermined distance from a target, said system comprising in combination: a microwave oscillator, a frequency modulator for modulating said oscillator at a frequency which is considerably lower than the doppler frequency occurring when the missile is falling at terminal velocity, a magic tee having first and second side arms, an H-arm and an E-arm, the output of said microwave oscillator being fed to said H-arm, an antenna connected to said first side arm and adapted to radiate energy towards a target and receive energy reflected therefrom, a load connected to said second side arm, a crystal detector disposed in said E-arm, said load being chosen so that only a relatively small portion of the energy from said microwave oscillator passes to said crystal detector to mix with the received energy passing to said detector from said first side arm, the output of said detector comprising a frequency modulated wave having a carrier frequency equal to the doppler frequency and sidebands equal, respectively, to the sums and differences of said carrier frequency and said modulation frequency and its harmonics, said frequency modulated wave having a frequency deviation which is dependent upon target distance, an amplifier to which said detected signal is fed, said amplifier being tuned to the doppler frequency and having a bandwidth which is equal to at least twice said modulation frequency, a limiter to which the output of said amplifier is fed for producing an essentially constant amplitude signal, a frequency discriminator to which the output of said limiter is fed, said discriminator producing an output voltage which is substantially proportional to target distance, and means connected to the output of said discriminator for functioning said fuze when the output of said discriminator is a predetermined value corresponding to said predetermined distance.



3,938,148

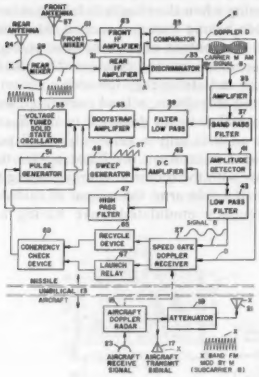
AUTOMATIC FREQUENCY CONTROL SYSTEM

Charles A. Hobson, Fremont, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 10, 1974, Ser. No. 487,341
Int. Cl.² G01S 7/02
U.S. Cl. 343—7 A **10 Claims**

1. An automatic frequency control system comprising:
a. first means for receiving reflected radar signals from a target;
b. second means for receiving radar signals directly from a radar transmitter means;
c. a voltage tuned solid state oscillator the output of which is connected to said first and second means;
d. third means responsive to the output of said second means for applying a first control voltage to said solid state oscillator;
e. fourth means responsive to the output of said first means for applying a second control voltage to said solid state oscillator;

f. fifth means responsive to the output of said second means; and



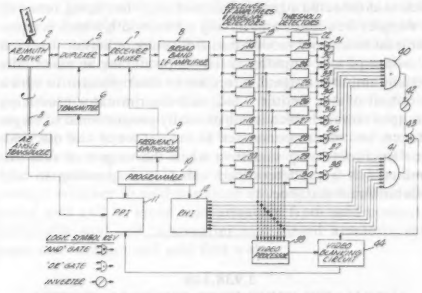
g. sixth means responsive to the output of said fifth means for modifying the output of said third means.

3,938,149

FREQUENCY SCAN RADAR SYSTEM WITH PROVISION FOR INTERFERENCE ELIMINATION

George William Grantham, West Covina, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Jan. 19, 1967, Ser. No. 611,538
Int. Cl.[2] G01S 7/28
U.S. Cl. 343—17.1 R 6 Claims



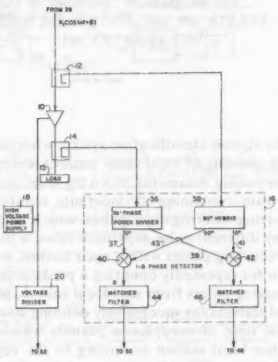
1. A pulsed radar system having an antenna for radiating, during each transmitted pulse, N beams of electromagnetic energy each narrow in at least a first plane, said antenna radiating said beams each at an angle in said first plane, which angle is a function of the instantaneous frequency of excitation of said antenna, having transmitting means for providing variable frequency excitation to said antenna in N discrete frequency steps within each of said transmitted pulses, the frequency spacing of said frequency steps being such that adjacent ones of said beams partially overlap in space, receiving means operative in the time between said transmitted pulses, said receiving means having N separate receiver channels corresponding to said N transmitted frequencies, and comprising the combination of: first means for time aligning and adding the outputs to produce a composite signal of at least part of the outputs of said N receiver channels; second means responsive to the outputs of said receiver channels for generating an output whenever at least one of the said outputs of said receiving channels contains a signal; third means for comparing the outputs of said N receiver channels for providing an output signal when signal is present contemporaneously in any two of said receiver channels which correspond to adjacent frequencies; fourth means responsive to the outputs of said second and third means for producing a control signal when a signal is present at the output of said second means but not at the output of said third means; and video switching means responsive to said control signal and connected in series with the output of said first means whereby said composite signal may be interrupted when and so long as said control signal is present in a predetermined condition.

3,938,150

MICROWAVE AMPLIFIER TUBE COHERENCY TEST SET

Chester C. Phillips, Rockville; William H. Zinger, Columbia; Robert F. Platte, Laurel; Melrose M. Jesurun, Silver Spring, and Dennis H. Matthias, Columbia, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1974, Ser. No. 482,974
Int. Cl.[2] G01S 7/40
U.S. Cl. 343—17.7 5 Claims



1. An apparatus for testing the coherency of an electronic device including an input and an output comprising:

pulse means connected to the input of said electronic device for energizing said electronic device with an input series of pulses;

first means coupled between said pulse means and said electronic device input for providing a first signal indicative of the input to said electronic device;

second means coupled to the output of said electronic device for providing a second signal indicative of the output of said electronic device;

detector means having first and second detector inputs and first and second detector outputs;

said first detector input being coupled to said first means such that said detector means receives said first signal and said second detector input being coupled to said second means such that said detector means receives said second signal;

whereby in response to said input series of pulses, a first series of signals are present at said first detector output and a second series of signals are present at said second detector output;

means for storing each of said first series of signals and each of said second series of signals;

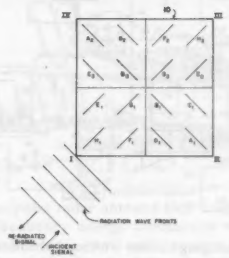
a first power divider connected to said first means for providing a first power divider signal and a second divider signal which is 90° phase shifted from said first power divider signal; and

a second power divider connected to said second means for providing third and fourth power divider signals.

3,938,151
PASSIVE RADAR DECOY HAVING A LARGE CROSS SECTION

Richard S. Trenam, Adelaide, Australia, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1970, Ser. No. 70,612
Int. Cl.² H01Q *15/00*
U.S. Cl. 343—18 B **4 Claims**

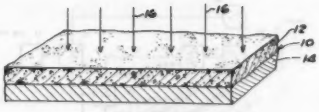


1. A passive, high-cross section radar decoy comprising:
a plastic balloon having a selectively predetermined volume,
said balloon having uniformly distributed on the surface thereof a plurality of printed circuit radiators,
said radiators being disposed and arranged in a Van Atta array configuration whereby radiant energy from a distant source received by said radiators is reradiated in the direction of the source.

3,938,152
MAGNETIC ABSORBERS

Dale M. Grimes; William W. Raymond; Ralph J. Hach, and Rodger M. Walser, all of Ann Arbor, Mich., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed June 3, 1963, Ser. No. 285,128
Int. Cl.² H01Q *17/00*
U.S. Cl. 343—18 A **7 Claims**

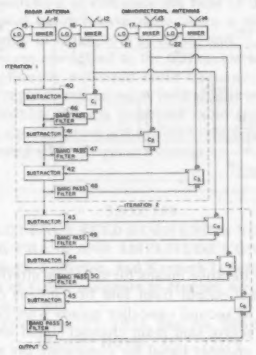


1. In an absorber for minimizing reflections of electromagnetic radiation of preselected radar wave lengths in the approximate corresponding preselected frequency range of 10 megacycles to 15,000 megacycles wherein a layer of absorber material has a highly conductive planar backing with the absorber material and the backing arranged and disposed so as to establish a standing wave with a maximum magnetic field positioned within said layer in response to radiation incident upon said layer, that improvement wherein said absorber is free of static, externally-applied magnetic fields, said absorber material comprises a ferrimagnetic metallic oxide having a complex permeability the imaginary part of which is substantially greater than the real part of said permeability at frequencies within said preselected range, said material has a complex permittivity, a complex permeability and a layer thickness τ such that the product of B τ is substantially less than unity where B is the wave number of radiation within said range measured inside the absorber material and said thickness of said layer is substantially less than one quarter of a wave length measured inside said material at preselected frequencies within said range so that absorption is substantially independent of said permittivity of said material at said preselected frequencies within said range.

3,938,153
SIDELOBE CANCELLER SYSTEM

Bernard L. Lewis, Oxon Hill, and Irwin D. Olin, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 499,260
Int. Cl.² G01S *3/06*
U.S. Cl. 343—100 LE **9 Claims**



1. An interference cancellation system comprising:
a main channel means for receiving desired signals and interference signals and forming a main channel signal;
a plurality of auxiliary channel means for receiving primarily interference signals and forming auxiliary channel signals.
first means coupled to said main channel means and said auxiliary channel means for comparing interference signals in the main channel means and each of the auxiliary channel means and providing cancelling signals which reduce interference in the main channel signal; and
at least one iterative means coupled to said first means and said auxiliary channel means for comparing the main channel signal from said first means with each of the signals of the auxiliary channel means and providing cancelling signals which further reduce interference in the main channel signal.

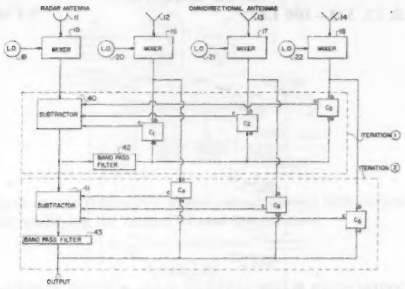
3,938,154
MODIFIED SIDELOBE CANCELLER SYSTEM

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 16, 1974, Ser. No. 499,374
Int. Cl.² H04B *7/00*
U.S. Cl. 343—100 LE **5 Claims**

1. An interference cancellation system comprising:
a main channel means for receiving desired signals and interference signals and forming a main channel signal;
a plurality of auxiliary channel means for receiving primarily interference signals and forming auxiliary channel signals;
first means for reducing interference in the main channel signal comprising, a plurality of canceller means with

each one coupled to receive said main channel signal and a different auxiliary channel signal for comparing the main channel interference signal and its respective auxiliary channel signal and providing a first cancelling signal therefrom and a first subtractor means coupled to said canceller means and said main channel means for combining the first cancelling signal from all of said canceller means in parallel and subtracting said first cancelling signals from the main channel signal to form a reduced interference main signal output, each of said canceller means being connected to receive the output of the first subtractor means as the main channel interference signal; and



at least one iterative means for reducing interference in the main signal output from said first means comprising, a plurality of second canceller means with each one coupled to receive said main channel signal and a different auxiliary channel signal for comparing the main channel interference signal and its respective auxiliary signal and providing a second cancelling signal therefrom and a second subtractor means coupled to said second canceller means and said first subtractor means for combining the second cancelling signal from all of said canceller means in parallel and subtracting said second cancelling signals from the main signal output to form a main signal output of further reduced interference, each of said second canceller means being connected to receive the output of said second subtractor means as the main channel interference signal.

3,938,155
HIGH STABILITY MODULATOR FOR INSTRUMENT LANDING SYSTEMS

William E. Mears, Leawood, Kans.; Clifford E. Mueller, Wellington, and David M. Staehling, Raytown, both of Mo., assignors to Wilcox Electric, Inc., Kansas City, Mo.

Filed July 15, 1974, Ser. No. 488,582
Int. Cl.² G01S *1/08*
U.S. Cl. 343—107 **6 Claims**

1. Transmitting apparatus for a radio navigation system which requires a first RF signal comprising a high frequency carrier amplitude modulated by the sum of a pair of signals of different, relatively low frequency, and a second RF signal comprising sidebands of said carrier derived from the difference between said pair of low frequency signals, said apparatus comprising:

means for generating said pair of low frequency signals;

means responsive to said pair of low frequency signals for summing the latter to provide a composite modulating signal;

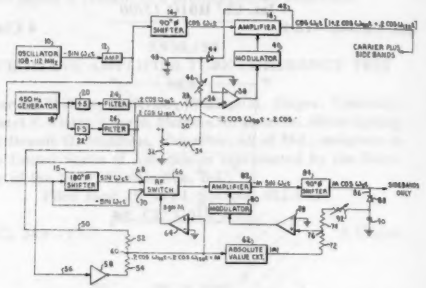
first output means responsive to said carrier and said composite modulating signal for amplitude modulating the carrier therewith to provide a carrier plus sidebands output signal presenting said first RF signal;

means responsive to said pair of low frequency signals for subtracting one from the other to provide a difference signal;

means responsive to said carrier and said difference signal for reversing the phase of the carrier with each change in the sign of said difference signal;

means for deriving a modulating signal which is the absolute value of said difference signal; and

second output means coupled with said phase reversal means and said deriving means for amplitude modulating



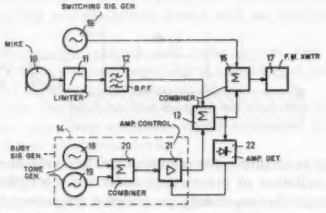
the phase-changing carrier with said absolute value modulating signal to provide a double sideband, suppressed carrier output signal presenting said second RF signal,

said phase reversal means including means for changing the phase of said carrier, 180°, switching means for delivering either said carrier or the 180° phase-changed carrier, and comparator means coupled with said switching means and responsive to polarity changes in said difference signal for operating said switching means to cause said carrier and said 180° phase-changed carrier to be alternately delivered to said second output means.

3,938,156
RADIO COMMUNICATION TRANSMITTER

Peter L:Son Lunden, Jarfalla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 20, 1974, Ser. No. 443,974
Claims priority, application Sweden, Feb. 28, 1973, 7302804
Int. Cl.² H04B *1/02*
U.S. Cl. 343—207 **3 Claims**



1. A radio transmitter comprising:

means for providing a speech signal in a selected band,

means for generating a busy signal outside of said selected band,

means for adding said speech and busy signals to provide a sum signal,

envelope signal producing means responsive to at least said speech signal to provide an envelope signal which varies with the instantaneous speech amplitude,

means for varying the amplitude of said busy signal in accordance with said envelope signal to provide said sum signal at constant amplitude.

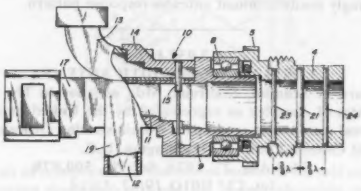
means for transmitting said constant amplitude sum signal in a single selected channel.

3,938,157

ROTATABLE RADAR ANTENNA FEED AND RECEIVER HORN

Orville G. Brickey, Indianapolis, Ind., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1969, Ser. No. 851,158
Int. Cl.² H01Q 3/12; G01S 9/22; H01P 5/16
U.S. Cl. 343—756 2 Claims



1. A monopulse radar antenna feed comprising:

a radio frequency energy comparator having a first sum port, a difference port, and a second sum output means including a coupling probe, said comparator being supported on the radar antenna by a first sum waveguide and a difference waveguide coupled in alignment with said first sum port and said difference port, respectively;

a cylindrical housing rotatably mounted to said comparator, and

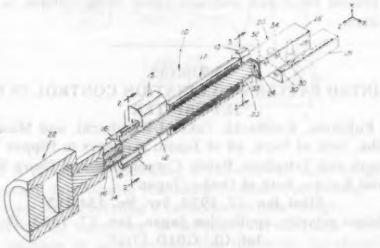
an enlarged susceptor pin and first and second smaller susceptor pins passing through diameters of said cylindrical housing, said susceptor pins being parallel with one another whereby linearly polarized energy radiated from said feed is rotated as said cylindrical housing is rotated.

3,938,158

ANTENNA ELEMENT FOR CIRCULAR OR LINEAR POLARIZATION

James D. Birch, Townsend; Max C. Mohr, Rockport, both of Mass., and Stephen R. Monaghan, Marshall Islands, assignors to Raytheon Company, Lexington, Mass.

Filed Dec. 19, 1973, Ser. No. 426,388
Int. Cl.² H01Q 13/02; H01P 1/17, 1/40
U.S. Cl. 343—756 3 Claims



1. An antenna element comprising:

a. a waveguide means for passing radio frequency energy introduced thereto and for radiating such radio frequency energy;

b. means for transforming the polarization of the radio frequency energy as such energy passes through the waveguide means for radiating such radio frequency energy selectively with either linear or circular polarization, such transforming means including

i. a first and a second nonreciprocal quarter-wave plate having field orientations within the waveguide means effectively 45° with respect to each other;

ii. a third nonreciprocal quarter-wave plate disposed between the first and the second nonreciprocal quarter-wave plate;

iii. a reciprocal quarter-wave plate disposed between thee radiating end of the waveguide means and the third nonreciprocal quarter-wave plate; and

iv. means for operating the third nonreciprocal quarter-wave plate in a selected one of a plurality of manners, such means including means for switching to align the field orientation of the third nonreciprocal quarter-wave plate with the field orientation of the first quarter-wave plate when a first one of the plurality of manners is selected, for switching to reverse the field orientation of the third nonreciprocal quarter-wave plate when a second one of the plurality of manners is selected, and for switching to eliminate the field of the third nonreciprocal quarter-wave plate when a third one of the plurality of manners is selected; and,

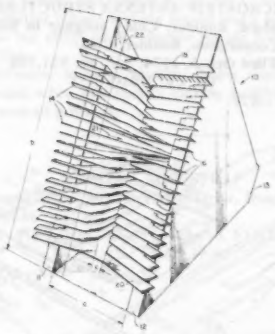
c. feed means connected to the waveguide means for introducing linearly polarized radio frequency energy within the waveguide means, such feed means including means for absorbing linearly polarized radio frequency energy having a polarization orthogonal to the polarization of the introduced radio frequency energy.

3,938,159

DUAL FREQUENCY FEED HORN USING NOTCHED FINS FOR PHASE AND AMPLITUDE CONTROL

James S. Ajioka, Fullerton, and Kenneth L. Schaffer, Diamond Bar, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 17, 1974, Ser. No. 506,830
Int. Cl.² H01Q 13/02, 15/24
U.S. Cl. 343—756 7 Claims



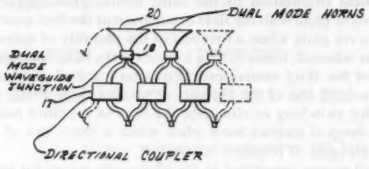
1. An antenna element comprising a horn-type radiating element, means for exciting said horn-type radiating element with two orthogonally polarized signals from a higher and a lower frequency band, and means for providing a plurality of conductive fin pairs on opposing inner surfaces of said horn-type radiating element in a plane parallel to that of the polarization of said signal from the higher frequency band, said conductive fin pairs having a plurality of notches disposed along the adjacent edges thereof having a nominal depth of one-quarter wavelength at the frequency of said polarized signal from said higher frequency band.

3,938,160

PHASED ARRAY ANTENNA WITH ARRAY ELEMENTS COUPLED TO FORM A MULTIPLICITY OF OVERLAPPED SUB-ARRAYS

Robert J. Mailloux, Wayland, and Peter R. Franchi, Winchester, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 7, 1974, Ser. No. 495,475
Int. Cl.[2] H01Q 3/26
U.S. Cl. 343—778 4 Claims



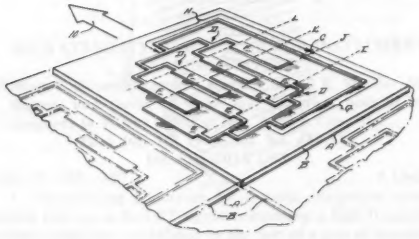
1. A phased array antenna comprising
an array of radiating elements,
a sum and difference hybrid connected to the input of each radiating element,
a microwave transmission line feed circuit connected to deliver electromagnetic wave power to each sum and difference hybrid,
a coupling means associated with each radiating element for coupling discrete amounts of the even and odd mode electromagnetic wave power propagating through the feed circuit of its associated radiating element with the electromagnetic wave power propagating through the feed circuits of each of the nearest adjacent radiating elements, and
means for establishing a given phase relationship between even and odd mode power at the aperture of each radiating element.

3,938,161

MICROSTRIP ANTENNA STRUCTURE

Gary G. Sanford, Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Oct. 3, 1974, Ser. No. 511,706
Int. Cl.[2] H01Q 9/38
U.S. Cl. 343—829 23 Claims



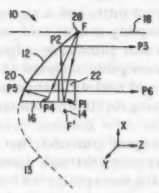
1. An antenna structure, said structure comprising:
an electrically conductive ground plane surface,
a layer of electrically conductive radiator elements having respectively corresponding feed line elements connected thereto,
a dielectric substrate having a predetermined thickness disposed between said ground plane surface and said layer,
said radiator elements comprising a first set of spaced apart radiators having respectively associated resonant axes directed in a first direction away from the connection of said feed line elements respectively associated therewith and a second set of spaced apart radiators having respectively associated resonant axes directed in a second direction opposite to said first direction away from the connection of said feed line elements respectively associated therewith,
the indvidual radiators of said first and said second sets of spaced apart radiators being interleaved, and
said feed line elements being connected between a common feed point and the individual ones of said radiator elements to provide electrical signals thereto in a transmit mode and to receive electrical signals therefrom in a receive mode said electrical signals having predetermined relative phase relationships for producing a correspondingly predetermined antenna response pattern.

3,938,162

VARIABLE BEAMWIDTH ANTENNA

Richard F. Schmidt, Seabrook, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Aug. 27, 1974, Ser. No. 500,979
Int. Cl.[2] H01Q 19/12, 15/14
U.S. Cl. 343—840 26 Claims



1. An antenna comprising:
a parabolic cylindrical main reflector having a first focal axis;
a cylindrical sub-reflector having a second focal axis;
said main reflector and sub-reflector being positioned with said first and second axes orthogonally and a point source on said second axis being an image of a line source on said first axis; and
a multibeam feed for transducing electromagnetic waves, said feed being positioned in a plane of an Airy disc of the antenna, said waves being reflected between said subreflector and said main reflector, said Airy disc lying on said second focal axis and said plane being oblique to said axes.

3,938,163

PRINTED PATTERN INCLINATION CONTROL IN INK JET PRINTER

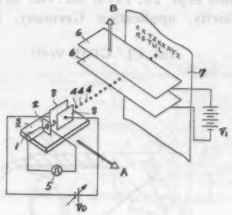
Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sharp Kabushiki Kaisha, both of Osaka, Japan

Filed Jan. 17, 1974, Ser. No. 434,217
Claims priority, application Japan, Jan. 17, 1973, 48-7495
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—75 9 Claims

1. An ink jet system printer comprising
a nozzle for issuing a stream of ink drops at a fixed velocity,
a charging electrode for charging the ink drops in accordance with signals to be recorded,
a pair of high voltage deflection plates having a constant high voltage electric field therebetween and thus deflecting the ink drops passing between said plates in a first coordinate direction in accordance with the amplitudes of the individual charges on the ink drops.

a record receiving member for forming images indicative of the signals by means of the deflected ink drops,

carriage means mounting said nozzle and said charging electrode for relatively moving the nozzle, said charging electrode and said ink drops with reference to the record receiving member in a second coordinate direction resulting in an inclination of said images, and



a pair of compensation electrodes mounted on said carriage means deposited between the charge electrode and the high voltage deflection plates having a compensation electric field of predetermined constant value in a different direction from the electric field formed by the high voltage deflection plates deflecting ink drops passing between said plates to modify said resulting inclination of said images in accordance with said value of said compensation field.

3,938,164

DEVICE FOR THERMALLY RECORDING A CATHODE-RAY TUBE IMAGE

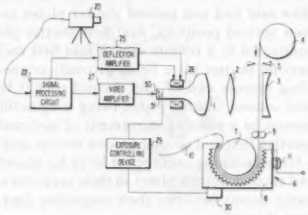
Masahiro Ohnishi; Yoshihiko Okamoto, and Takahiro Ohta, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 29, 1974, Ser. No. 501,578

Claims priority, application Japan, Aug. 29, 1973, 48-97053

Int. Cl.[2] G01D *15/10*; **G03B** *27/72*

U.S. Cl. 346—110 R **4 Claims**



1. A device for recording a cathode-ray tube image on a thermally developable recording medium comprising:

means for generating a cathode-ray tube image;

means for supplying a thermally developable recording medium so as to expose said thermally developable recording medium to the image of said cathode-ray tube; and

means for thermally developing said exposed thermally developable recording medium; and including

means for detecting the temperature of the thermal developing means to convert the detected temperature into an electrical signal; and

means responsive to said electrical signal for controlling the degree of exposure of said thermally developable recording medium to the image of said cathode-ray tube.

3,938,165

PHOTOGRAPHIC CAMERA WITH AUTOMATIC EXPOSURE CONTROL MEANS

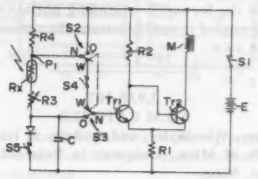
Seizi Asano, Okegawa, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed June 24, 1975, Ser. No. 589,846

Claims priority, application Japan, July 23, 1974, 49-87510[U]

Int. Cl.[2] G03B *7/08*, *17/38*

U.S. Cl. 354—50 **8 Claims**



1. A photographic camera comprising,

a camera body containing a shutter mechanism therein and having a shutter release button thereon to be depressed for operating said shutter mechanism,

an automatic exposure control means provided in the camera body for controlling said shutter mechanism in accordance with the scene brightness measured thereby to obtain a photograph of normal exposure,

a shutter release locking means provided in the camera body for locking said shutter mechanism to prevent the same from operating when the scene brightness is below a predetermined level,

a self-timer provided in the camera body,

a self-timer starting member provided in the camera body and operatively connected to said self-timer for starting the operation of the self-timer, and

a shutter locking nullifying lever pivotally mounted on the camera body movable between a first position where the shutter release mechanism is capable of being locked by said shutter release locking means and a second position where the effect of the shutter release locking means is nullified,

said self-timer starting member being capable of being operated when said shutter locking nullifying lever is in said second position.

3,938,166

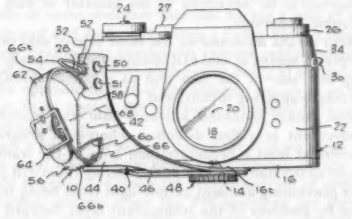
CAMERA SIDE STRAP

Conrad Beebe Sloop, 9092 Bermuda Drive, Huntington Beach, Calif. 92646

Filed Oct. 10, 1974, Ser. No. 513,761

Int. Cl.[2] G03B *29/00*

U.S. Cl. 354—82 **10 Claims**



1. A camera assembly comprising:

a camera having a body with front, rear, side, top, and bottom walls and having means defining an optical axis

portion which extends in a direction substantially normal to the plane of said front wall through the center portion thereof,

hand strap means forming a loop for closely receiving a plurality of fingers; and

means coupled to said camera body for holding said hand strap means to said camera body near one side of said camera, said holding means holding said hand strap means with one side of said loop next to said camera body to allow fingers extending through the loop to grasp the camera body, and with the axis of the loop extending at a forward-upward incline as seen in a side elevation view, and with the forwardly-extending portion of the axis of the loop angled inwardly toward the optical axis as seen in a plan view.

3,938,167

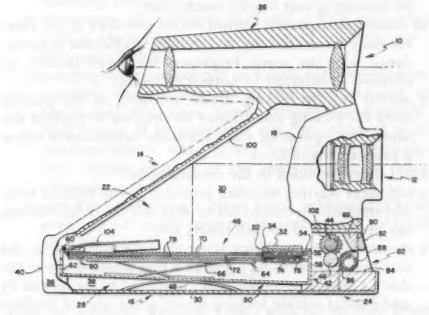
FILM CATCHER

John N. Amey, Winchester, and Andrew S. Ivester, Charlestown, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1974, Ser. No. 466,414

Int. Cl.[2] G03B 17/50

U.S. Cl. 354—86 **12 Claims**



1. Photographic apparatus for processing and releasably retaining an exposed film unit of the type including a plurality of superposed layers including photosensitive and transparent layers, and a processing composition including an opacifying agent which is adapted to be spread across the photosensitive layer comprising:

means for supporting the film unit in position for exposure of the photosensitive layer;

pressure-applying means including a pair of juxtaposed members between which the exposed film unit is adapted to be advanced leading edge first during spreading of the processing composition;

means defining an exit opening located forwardly of said pressure-applying means through which the film unit is adapted to be advanced to the exterior of said photographic apparatus;

resilient means mounted on the same side of said pressure-applying means as said exit opening for frictionally engaging one side of the film unit as it passes through said pressure-applying means; and

opaque means mounted adjacent said exit opening for movement in a first direction wherein it progressively covers at least a predetermined area of the transparent layer of the film unit as it passes through said exit opening for preventing ambient actinic light from being transmitted by portions of the transparent layer forward of said pressure-applying members to portions of the transparent layer rearwardly of said pressure-applying means, and in a second direction, generally opposite said first direction wherein it cooperates with said resilient means for releasably retaining an end portion of the film unit after the film unit has moved out of engagement with said pressure-applying means.

3,938,168

HIGH SPEED CAMERA SHUTTER

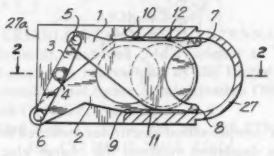
Karl-Heinz Lange, Bunde, Germany, assignor to Balda-Werke, Bunde, Germany

Filed Sept. 20, 1974, Ser. No. 507,914

Claims priority, application Germany, Feb. 25, 1974, 2408932

Int. Cl.[2] G03B 9/40

U.S. Cl. 354—247 **11 Claims**



1. A high speed camera shutter comprising first and second asymmetric substantially planar shutter plates arranged in tandem, a first and second groove means corresonding respectively to said first and second shutter plates, each of said first and second shutter plates being longitudinally slidable between first and second positions in said respective first and second groove means along respective pairs of substantially opposed points of each of said first and second shutter plates, said first shutter plate having a substantially circular aperture therein for defining an exposure clearance area, said second shutter plate having a substantially semicircular recess in the perimeter thereof for concomitantly defining an exposure clearance area therein, said exposure clearance areas of said first and second shutter plates being substantially alignable for defining a shutter opening when said first and second shutter plates are respectively in their second positions, a pivotally mounted rocker lever oscillatable on its pivotal axis including first and second lever arms, said first lever arm thereof having a longer length relative to the pivotal axis of said rocker lever than said second lever arm so as to optimize said shutter opening when said first and second shutter plates are respectively in their second positions, said first shutter plate being pivotally connected to a remote end of said first rocker lever arm, said second shutter plate being pivotally connected to a corresponding remote end of said second rocker lever arm, said first and second shutter plates being longitudinally slidable in response to a pivoting movement of said rocker lever in said respective first and second groove means, and mechanical means for osciallating said rocker lever for thereby sliding said first and second shutter plates in their respective first and second groove means between their respective first and second positions thereof.

3,938,169

SHUTTER RELEASE STOP DEVICE FOR AN ELECTRIC SHUTTER

Kiyoshi Kitai, Tokyo, Japan, assignor to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 10, 1974, Ser. No. 459,720

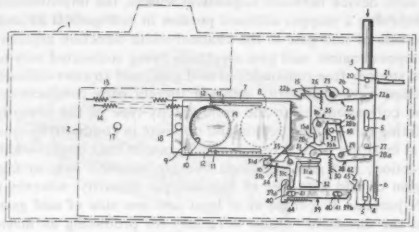
Claims priority, application Japan, Apr. 11, 1973, 48-42697

Int. Cl.[2] G03B 9/40, 9/62

U.S. Cl. 354—268 **5 Claims**

1. In a shutter for a camera; a shutter blade means movable from a cocked position to an uncocked position for opening and closing an exposure aperture; operating mechanism for operating the shutter blade means comprising a release member operable for initiating taking of an exposure, an electro-

magnet for controlling the exposure time, a locking member for for selectively locking said release member to preclude initiating taking of an exposure; detecting means detecting a first condition when said shutter blade means is in said uncocked position and for detecting a secod condition when said electromagnet is not energized sufficiently to control exposure time; means controlled by said detecting means for rendering said locking means effective when at least one of the first and second conditions is present.



3,938,170

STILL CAMERA WITH EXPANSIBLE HOUSING

Alfred Winkler, Munich; Dieter Engelsmann, Unterhaching, and Rolf Schröder, Baldham, all of Germany, assignors to AGFA-Gevaert, AG, Leverkusen, Germany

Filed July 23, 1974, Ser. No. 491,144

Claims priority, application Germany, July 31, 1973, 2338794

Int. Cl.² G03B *17/02*

U.S. Cl. 354—288 **9 Claims**

1. In a photographic apparatus, particularly in a still camera, a combination comprising a housing having a rear side and including a first section and a second section which is supported by and is reciprocable relative to said first section between first and second positions in which one of said sections respectively conceals and exposes a portion of the other of said sections, said first and second sections respectively having first and second walls which are spaced apart in at least one of said positions of said second section whereby said walls define at least one slot; and a barrier located at the rear side of said housing, supported by one of said sections and overlying at least a portion of said slot in said one position of said second section.

3,938,171

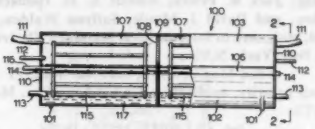
PHOTOGRAPHIC DEVELOPER APPARATUS

Raymond Joseph Masygan, Burlington, Canada, assignor to Alex E. Clark Limited, Islington, Canada

Division of Ser. No. 80,836, Oct. 15, 1970, abandoned. This application Nov. 20, 1973, Ser. No. 417,523

Int. Cl.² 603D *13/00*

U.S. Cl. 354—299 **2 Claims**



1. A tank, for processing sheets of photographic material or film mounted circumferentially on a reel rotatably mountable in the tank, comprising:

a horizontally oriented closed tubular cylinder having a cylindrical wall defining a chamber, the cylinder being divided into an upper section and a lower section, the upper section being hinged to the lower section and openable for access to the chamber;

means to feed air into the upper portion of the chamber;

means to feed liquid into the lower portion of the chamber;

the wall of the cylinder being interrupted in the area of the junction between the upper and lower sections thereof to define a longitudinal slot, a flap being freely hinged on the wall and covering the slot, whereby air in the chamber may pass out therefrom through the slot and liquid in the lower portion of the chamber may, on rotating the cylinder on the longitudinal axis thereof, pass out from the chamber through the slot.

3,938,172

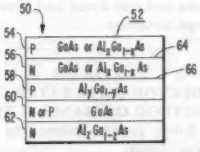
SEMICONDUCTOR INJECTION LASER

Harry Francis Lockwood, New York, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed May 22, 1974, Ser. No. 472,292

Int. Cl.² H01S *3/00*; **H01L** *29/161*

U.S. Cl. 357—18 **11 Claims**



1. A semiconductor injection laser comprising

a body of semiconductor material having a pair of spaced opposed end surfaces forming a Fabry-Perot cavity, said body having four contiguous regions extending between said end surfaces with each region being of a conductivity type opposite to that of the adjacent region so as to provide three spaced PN junctions extending between said end surfaces,

at least a portion of at least one of the regions along one of the outer PN junctions being a recombination zone where light is generated upon the recombination of oppositely charged carriers when the PN junctions are forwardly biased to inject one type of charged carriers into said recombination zone,

means along at least one side of the recombination zone for confining a portion of the generated light in said recombination zone, and

means along at least one side of the recombination zone for confining the injected charged carriers in said recombination zone.

3,938,173

OPTICALLY COUPLED SEMICONDUCTIVE SWITCHING DEVICES

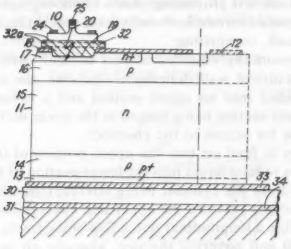
Thomas M. Jackson, Bishops Stortford; Alan D. Brisbane, Epping; Jack R. Peters; Rudolf A. H. Heinecke, both of Harlow, and David J. Moule, Saffron Walden, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 3, 1974, Ser. No. 466,571

Claims priority, application United Kingdom, May 4, 1973, 21241/73

Int. Cl.² H01L *31/12, 29/74*

U.S. Cl. 357—19 **5 Claims**



1. An optically coupled semiconductor switching device comprising:

a light-emitting diode having a mesa construction;

a triggerable pnpn semiconductor switching structure; and

a preformed intervening light transmitting dielectric material coupled between said switching structure and said light-emitting diode for providing electrical insulation and optical coupling between said diode and said structure, said preformed intervening light transmitting dielectric material comprising a first mass of dielectric material coated on opposite sides with a layer of a second dielectric material, said second material having a lower melting point than said first mass and providing a bond between said first mass and said diode and between said first mass and said pnpn structure.

3,938,174

SEMICONDUCTOR INTEGRATED CIRCUIT AND METHOD OF MANUFACTURE

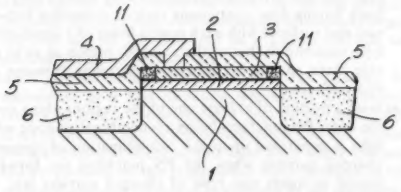
Tadashi Sano, Suwa, Japan, assignor to Kabushiki Kaisha Seikosha, Tokyo, Japan

Filed Jan. 9, 1974, Ser. No. 432,116

Claims priority, application Japan, Jan. 9, 1973, 48-4934

Int. Cl.² H01L *29/78, 27/02, 29/34, 29/04*

U.S. Cl. 357—23 **3 Claims**



1. In an insulated gate semiconductor structure, a substrate bearing at least two semiconductor devices, each device including a source and a drain defining a channel therebetween, a gate insulating film overlying said channel, a polycrystalline silicon gate overlying said gate insulating film, a gate electrode connected to said gate, and stopper regions defined by impurity diffused into said substrate around each device and between said respective devices for inhibiting the formation of inversion layers in said substrate between the source and drain of each device between respective devices, the improvement comprising a stopper-diffused portion in said gate at at least one side of said gate in the channel-width direction adjacent a stopper region, said gate electrode being connected only to said stopper-free remainder of said gate, said stopper-diffused portion having impurity diffused therein of a conductivity-type corresponding to the conductivity-type of the impurity defining said stopper region and opposite in conductivity-type to at least the central region of said gate in the channel-width direction, said gate electrode being connected only to said region of said gate free of said stopper impurity, whereby a P-N junction is formed at at least said one side of said gate, and the threshold voltage necessary for producing an inversion layer under said one side of said gate is substantially greater than under the remainder of said gate.

3,938,175

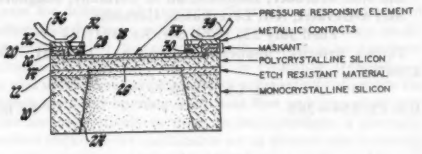
POLYCRYSTALLINE SILICON PRESSURE TRANSDUCER

James M. Jaffe, Southfield, and John Y. W. Seto, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 463,515, April 24, 1974, abandoned. This application Nov. 25, 1974, Ser. No. 526,580

Int. Cl.² H01L *29/84, 29/06, 29/04*

U.S. Cl. 357—26 **2 Claims**



1. A semiconductor pressure transducer having a thin vapor deposited polycrystalline silicon diaphragm providing an extremely sensitive and temperature stable device, said pressure transducer comprising:

a base member having a similar coefficient of thermal expansion to that of silicon, said base member having two major end surfaces and an aperture extending therebetween;

a layer of etch-resistant material on one of said base member end surfaces, said etch-resistant material having a crystallographic structure so as to promote vapor deposition of polycrystalline silicon thereon;

a thin, vapor deposited intrinsic polycrystalline silicon film on said etch-resistant material and covering said aperture in said base member thereby providing an extremely sensitive pressure responsive diaphragm bridging said aperture, said polycrystalline silicon diaphragm being less than about 10 microns thick and having a resistivity of at least 10^6 ohm-centimeters, said diaphragm being free of any material having a dissimilar coefficient of thermal expansion thereby providing improved temperature stability for said pressure transducer;

a pressure responsive electronic device formed in centrally located portions of said polycrystalline silicon diaphragm wherein said device is automatically electrically isolated by the surrounding high resistivity polycrystalline silicon; and

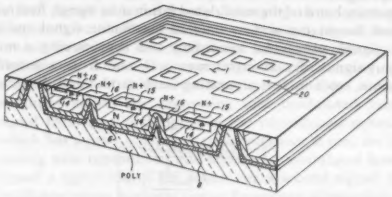
means for making electrical connection to said pressure responsive electronic device thereby providing electrical access to said pressure transducer.

3,938,176

PROCESS FOR FABRICATING DIELECTRICALLY ISOLATED SEMICONDUCTOR COMPONENTS OF AN INTEGRATED CIRCUIT

Benjamin Johnston Sloan, Jr., Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 24, 1973, Ser. No. 400,492
Int. Cl.² H01L 27/12
U.S. Cl. 357—49 6 Claims



1. A dielectrically isolated semiconductor component of an integrated circuit in a substrate, comprising:

a. a dielectrically isolated pocket of monocrystalline semiconductor material of one conductivity type in said substrate, said isolation being furnished by a layer of insulating material between said pocket and the remainder of said substrate, said insulating layer having selected spaced ridges in close proximity to one surface of said pocket;

b. a region of said one conductivity type but of greater conductivity in said pocket and adjacent said insulating layer;

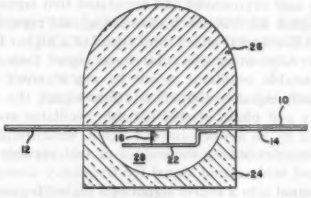
c. a plurality of rows of semiconductor regions of the opposite conductivity type in said pocket; and, d. a plurality of rows of high conductivity regions of said one conductivity type in said pocket, alternating with said rows of semiconductor regions, said high conductivity regions extending from the surface of said pocket in contact with said region of high conductivity, along said ridges.

3,938,177

NARROW LEAD CONTACT FOR AUTOMATIC FACE DOWN BONDING OF ELECTRONIC CHIPS

Niels Junior Hansen, Camp Hill, and Ronald James Capp, Mechanicsburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 373,227, June 25, 1973, abandoned. This application Apr. 29, 1974, Ser. No. 465,383
Int. Cl.² H01L 23/28
U.S. Cl. 357—72 14 Claims



1. In combination with an electronic chip having at least one metallic bonding pad thereon and associated circuitry for the chip, an improved lead frame assembly comprising:

a thin flexible substrate of insulating material, and

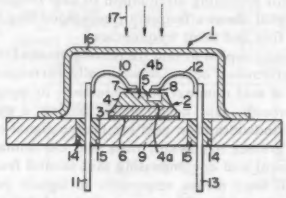
at least one narrow lead printed on said substrate in alignment with a respective pad of said chip, each said lead having a width in the range of 23% to 35% of the width of said chip.

3,938,178

PROCESS FOR TREATMENT OF SEMICONDUCTOR

Shunji Miura, Higashikurume, and Toshio Kawamata, Fujimi, both of Japan, assignors to Origin Electric Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1972, Ser. No. 316,579
Claims priority, application Japan, Dec. 22, 1971, 46-104403
Int. Cl. B01j 17/00
U.S. Cl. 357—91 9 Claims



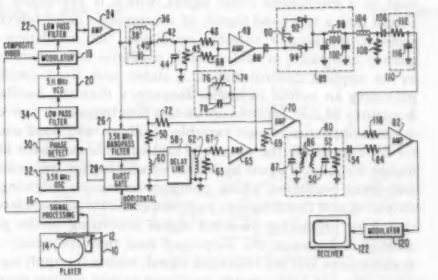
1. A process for imparting desirable characteristics to transistor devices of the type having a base region exposed at one surface of said transistor and an emitter region positioned at one side of said base region between an emitter electrode and a non-exposed, masked portion of said base region, said exposed base region being unmasked, and said emitter electrode being of electron ray absorptive material, said process comprising the steps of, irradiating the transistor device with electron rays directed towards said one side of said base region and into said exposed portion of said base region but with said emitter electrode masking said masked portion of said base region, said electron rays being of sufficient energy to produce recombination centers in the unmasked base portion while leaving the masked base portion substantially free of lattice defects, and thereafter heat treating said transistor device.

3,938,179

COMB FILTER FOR VIDEO PROCESSING

John Gordon Amery, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 16, 1974, Ser. No. 506,446
Int. Cl.² H04N 9/535, 9/42, 5/76
U.S. Cl. 358—4 13 Claims



1. In a system receptive to a first composite video signal having a nominal line frequency and including a luminance signal component occupying a given band of frequencies and a chrominance signal component interleaved therewith within only a portion of said given band, said chrominance component being in the form of sidebands of a subcarrier at a first frequency; apparatus for transcoding said first composite video signal to a second composite video signal having a chrominance signal component in the form of sidebands of a subcarrier at a second frequency comprising:

means for receiving said first composite video signal;

means for frequency translating the constituent frequency portions of said first composite video signal such that a portion of said translated signal has a chrominance subcarrier at a frequency corresponding to said second frequency, said frequency translating means comprising means for amplitude modulating oscillations of a third frequency in accordance with the output of said receiving means;

band rejection filter means coupled to said translating means for providing attenuation to said frequency translated signal about a frequency corresponding to the sum of said first and third frequencies;

delay means coupled to said translating means for providing a predetermined delay, substantially corresponding to a period at said nominal line frequency, to signals passing therethrough, said delay means having a passband of lesser bandwidth than said luminance signal component but of greater bandwidth than said chrominance signal component and encompassing said second frequency;

first comb filter means responsive to signals provided by said band rejection filter means and said delay means for forming a luminance signal component that is substantially free of chrominance signals;

second comb filter means responsive to signals provided by said frequency translating means and said delay means for forming a frequency translated chrominance signal component that is substantially free of luminance signals; and

means for combining signals formed by the respective first and second comb filter means for providing said second composite video signal.

3,938,180

COLOR TELEVISION SIGNAL RECORDING EMPLOYS CHROMINANCE BELOW LUMINANCE SPECTRUM AND COLOR BURST TO CORRECT TIMING VARIATIONS

Ichiro Arimura, Kyoto; Hiroshi Taniguchi, Hirakata, and Hiromichi Tanaka, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 163,272, July 16, 1971, abandoned. This application Feb. 26, 1974, Ser. No. 445,922

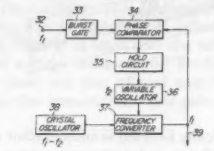
Claims priority, application Japan, July 20, 1970, 45-64105; Dec. 9, 1970, 45-109905

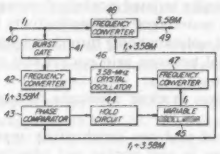
Int. Cl.[2] H04N *5/76, 9/02*

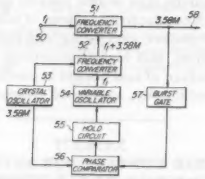
U.S. Cl. 358—8 **3 Claims**

1. A signal processing system for removing a jitter component in a modulated color signal, which is previously converted into a low band signal, of a composite color television signal comprising a variable oscillator, the oscillation frequency and phase of said variable oscillator being controlled by an applied control signal, a stable and fixed oscillator providing an output of higher frequency than the oscillation frequency of said variable oscillator, first frequency converter means connected to said variable oscillator and fixed oscillator for converting the output of said variable oscillator into a higher frequency signal by means of said higher frequency of said fixed oscillator, phase comparator means receiving the output of said first frequency converter means and a reference signal for producing an error signal according to the phase difference between the output of said first frequency converter means and the reference signal, means for applying said error signal to said variable oscillator as said control signal to control the oscillation frequency and phase of said variable oscillator, said oscillation frequency being lower than that of said reference signal, second frequency converter means connected to said first frequency converter means and receiving the modulated color signal for producing a difference signal of the output of said first frequency converter means and the modulated color signal, means for separating a burst signal from the modulated color signal, third frequency converter means connected to said burst signal separating means and fixed oscillator for converting said separated burst signal into a higher frequency signal by means of said higher frequency of said fixed oscillator, and means for connecting said converted burst signal to said phase comparator as said reference signal.

2. A signal processing system for a composite color television signal comprising: means for separating a luminance signal from a color signal including a color burst signal in the standard color television signal, means for frequency modulating the separated luminance signal, first frequency converter means for frequency converting the separated color signal into a first signal of a frequency belonging to a low band of a frequency band of the modulated luminance signal, first mixer means for mixing said modulated luminance signal and said first signal, means for recording and reproducing a mixed output signal of said mixer means in and from a recording medium, means for separating said modulated luminance







signal from said first signal in the reproduced mixed signal which has a jitter component, demodulator means for demodulating said reproduced and separated modulated luminance signal, a signal source for generating a second signal of a frequency equal to that of the color subcarrier of the standard color television signal, second frequency converter means receiving said reproduced and separated first signal and said second signal for frequency converting said reproduced and separated first signal into a third signal of a higher frequency, means for separating the color burst signal from said third signal, variable oscillator means having a center frequency substantially equal to that of said first signal, the oscillation frequency and phase of said variable oscillator means being controlled by an applied control signal, third frequency converter means receiving the output of said variable oscillator means and said second signal for frequency converting said second signal into a fourth signal of a higher fequency, phase comparator means for comparing the phase of said color burst signal with that of said fourth signal and producing an output according to the phase difference therebetween, means for applying said output of said phase comparator means to said variable oscillator means as said control signal, fourth frequency converter means receiving said fourth signal and said reproduced and separated first signal for frequency converting said reproduced and separated first signal into a fifth signal of a frequency equal to that of the color subcarrier of the stan-

dard color television signal, and second mixer means for mixing said fifth signal and the demodulated luminance signal derived from said demodulator means to obtain the standard color television signal.

3. A signal processing system for a composite color television signal comprising: means for separating a luminance signal from a color signal including a color burst signal in the standard color television signal; means for frequency modulating the separated luminance signal; first frequency converter means for frequency converting the separated color signal into a first signal of a frequency belonging to a low band of a frequency band of the modulated luminance signal; first mixer means for mixing said modulated luminance signal and said first signal; means for recording and reproducing a mixed output signal of said mixer means in and from a recording medium; means for separating said modulated luminance signal from said first signal in the reproduced mixed signal which has a jitter component; demodulator means for demodulating said reproduced and separated modulated luminance signal; a signal source for generating a second signal; variable oscillator means having a center frequency substantially lower than that of said second signal, the oscillation frequency and phase of said variable oscillator means being controlled by an applied control signal; second frequency converter means receiving an output of said variable oscillator means and said second signal for frequency converting said output of said variable oscillator means into a third signal, the frequency of which is higher than that of said first signal by the frequency of the color subcarrier of the standard color television signal; third frequency converter means receiving said third signal and said reproduced and separated first signal for frequency converting said reproduced and separated first signal into a fourth signal of a frequency equal to that of the color subcarrier of the standard color television signal; means for separating a color burst signal from said fourth signal; phase comparator means for comparing the phase of said second signal with that of said color burst signal and producing an output according to the phase difference therebetween; means for applying said output of said phase comparator means to said variable oscillator means as said control signal, a single closed loop for controlling the oscillation frequency and phase of said variable oscillator consisting of said second frequency converter means, third frequency converter means, color burst signal separating means, phase comparator means and applying means; and second mixer means for mixing said fourth signal and the demodulated luminance signal derived from said demodulator means to obtain the standard color television signal, whereby the oscillation frequency of said variable oscillator is sufficiently low for locking said closed loop despite center frequency drift caused by changes in ambient temperature.

3,938,181
AUTOMATIC LUMINANCE CHANNEL FREQUENCY RESPONSE CONTROL APPARATUS

Jack Avins, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1974, Ser. No. 516,589
Int. Cl.[2] H04N *5/14*
U.S. Cl. 358—38 **18 Claims**

1. Apparatus for processing television video signals, comprising:

a source of video signals;

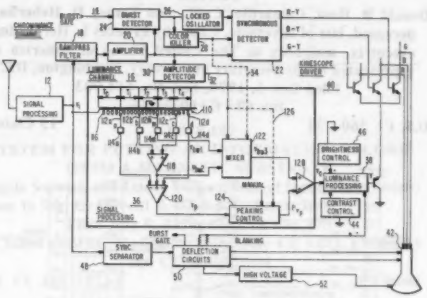
signal delaying means coupled to said source of video signals;

a plurality of signal coupling means coupled to said signal delaying means for developing a plurality of delayed video signals;

first means for combining at least a first and a second of said delayed video signals being spaced apart in time by a time interval substantially equal to NT/2, where T is the period of a predetermined signal component supplied by said source and N is an integer greater than one, to produce a first combined signal;

means for deriving a first bandwidth determining signal from at least a third of said delayed video signals being located in time between said first and second delayed video signals;

means for deriving a second bandwidth determining signal from at least a fourth and a fifth of said delayed video signals each being located in time between said first and second delayed video signals;



second means for combining one of said bandwidth determining signals with said first combined signal to produce a second combined signal;

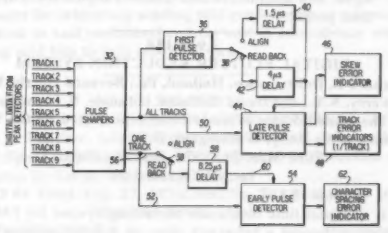
means for selectively combining said first and second bandwidth determining signals to produce a third bandwidth determining signal including controlled amplitude portions of said first and second bandwidth determining signals; and

third means for combining said third bandwidth determining signal and said second combined signal to produce an output signal.

3,938,182
AUTOMATIC CHARACTER SKEW AND SPACING CHECKING NETWORK

Robert T. McKenna, Rockville, Md., assignor to The United States of America as represented by the United States National Aeronautics and Space Administration Office of General Counsel-Code GP, Washington, D.C.

Filed Jan. 6, 1975, Ser. No. 538,983
Int. Cl.[2] G11B *15/02*
U.S. Cl. 360—26 **10 Claims**



1. A network for monitoring character skew and spacing in a tape recording and reproducing system comprising:

a plurality of pulse shaping means adapted to be coupled to a like plurality of track outputs from said tape recording and reproducing system,

first pulse detector means for detecting the first pulse generated by said pulse shaping means,

late pulse detecting means coupled to said pulse shaping means for receiving pulses therefrom,

first timing means coupled to said first pulse detector means and to said late pulse detecting means for inhibiting said late pulse detecting for a first predetermined interval following detection of said first pulse; and,

skew error indicating means coupled to said late pulse detecting means for indicating the existance of late pulses representing an unacceptable skew condition.

3,938,183

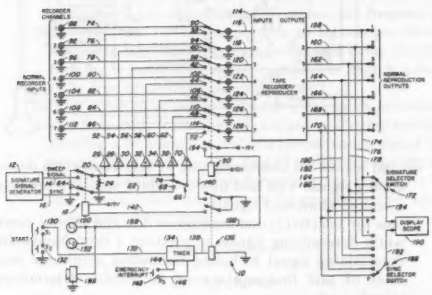
MAGNETIC TAPE SIGNATURE SIGNAL INJECTION DEVICE

Donald R. Hust, Camarillo, Calif., and Emory D. Heberling, deceased, late of Riverside, Calif., by Frances L. Herberling, executrix, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 3, 1974, Ser. No. 511,903

Int. Cl.[2] G11B 27/36

U.S. Cl. 360—31 **13 Claims**



1. An apparatus for injecting a signature signal onto a magnetic tape comprising:

a. means for generating a signature signal having an output upon which said signature signal appears;

b. a plurality of magnetic tape recorder channel input lines one each connected between one pair each of a plurality of first and second recorder inputs;

c. switching means for connecting said signature signal generating means output to one one of said plurality of second recorder inputs and disconnecting said plurality of channel input lines from said plurality of second recorder inputs; and

d. timing means communicating with said switching means for allowing said switching means to inject said signature signal and disconnect said channel inputs for a specific time period.

3,938,184

DIGITAL FLUTTER REDUCTION SYSTEM

Richard E. DeFrancesco, Holland, Pa.; Bernard Harris, Dobbs Ferry, N.Y., and David Hoffman, Hillsdale, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 21, 1975, Ser. No. 560,855

Int. Cl.[2] G11B 5/09

U.S. Cl. 360—51 **10 Claims**

1. A digital time base error correcting system for FM tape recorders having a reference tone on a first tape track and data signals on a second tape track comprising, in combination:

timing means for generating a series of clock pulses;

first pulse generating means connected to receive said clock pulses for producing a series of periodic output pulses having a frequency equal to the average frequency value of said reference tone;

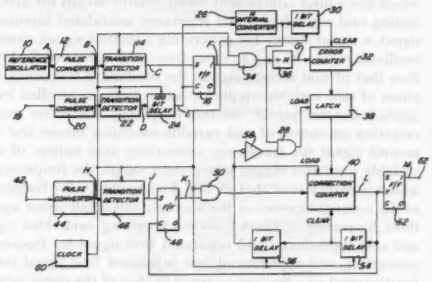
second pulse generating means adapted to receive said reference tone and connected to receive said clock pulses for producing a series of output pulses indicative of the zero crossings of said tone;

delay means connected to receive said clock pulses and said second generating means output pulses for producing a time delayed replica output thereof;

pulse width encoding means connected to receive said first pulse generating means output signals and said delay means output for producing an output pulse having a variable width depending upon the time separation between corresponding ones of said first pulse generating means output signals and the delay means output pulses;

first counting means connected to receive said pulse width encoding means output pulse and said clock pulses for producing a digital count indicative of the width of said pulse width encoding means output pulse;

third pulse generating means adapted to receive said data signals and connected to receive said clock pulses for producing a series of output pulses indicative of the zero crossings of said data signals;



second counting means connected to receive said first counting means digital count and said clock pulses for counting from said digital count to a predetermined count upon the receipt of individual ones of said third pulse generating means output pulses and for producing an output pulse indicative of the occurrence of said predetermined count; and

fourth pulse generating means connected to receive said second counting means output pulse for producing a series of output pulses having respective widths corresponding to the sequential time occurrence of said second counting means output pulse;

whereby said fourth pulse generating means output pulses are indicative of the data signals corrected for time base error.

3,938,185

CASSETTE TAPE DATA PROCESSING TERMINAL UNIT WITH LATCH

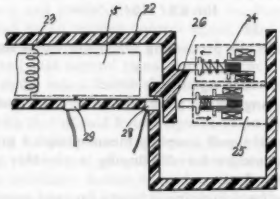
Youichi Ito, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed June 28, 1974, Ser. No. 484,344

Claims priority, application Japan, June 29, 1973, 48-74058

Int. Cl. G11b 15/04, 15/10

U.S. Cl. 360—69 **5 Claims**



1. A data processing terminal unit comprising:

a cassette tape including a data field;
recording means associated with said cassette tape for recording data thereon;
data input means connected with said recording means for transmitting data therethrough to said cassette tape;
said cassette tape including at least one data field;
entry means in said data input means providing start and end marking signals to said recording means to effect start and end markings on said tape defining the beginning and end, respectively, of said data field; and
housing means for releasably receiving said cassette tape, comprising:
closure means for closing and opening said housing to contain or release said cassette tape therefrom,
sensing means in said housing means detecting the presence and absence of a said cassette tape in said housing and the closed and open states of said closure means and providing state signals representative thereof,
circuit means responsive to said state signals and said start and end marking signals to provide closure control signals in response to predetermined combinations of said state and marking signals, and
latch means responsive to said closure control signals to selectively preclude opening and closing of said closure means.

3,938,186

APPARATUS FOR CONVERTING VISUALLY LEGIBLE NUMERICAL CHARACTERS INTO A BINARY CODE

Daniel Paul Henri Destame, Anes-Dreux, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 388,254, Aug. 14, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,512
Claims priority, application France, Sept. 18, 1972, 72.32975
Int. Cl.² G06K *9/18*
U.S. Cl. 340—146.3 Z **2 Claims**

1. Apparatus for converting into a binary code a visually legible numerical character selected from a closed group of numerical characters, said numerical character being present within a character format area on a support, said apparatus comprising:
a set of exactly four character-identifying sensing elements, each for deriving from a predetermined portion of the character format area, a binary information element;
means for juxtaposing said set of sensing elements in proper alignment with said character format area, said sensing elements sensing and directly converting a machine printable numerical character into a corresponding unique four-bit digital number; and
means for converting the group of unique digital numbers corresponding to said closed group of numerical characters into binary digital form;
wherein said character format area includes alignment areas and said apparatus includes an additional sensing element for deriving alignment information;
wherein a fifth sensing element is provided for deriving a fifth binary information element from a fifth predetermined portion within the character format area, said sensing element for supplying a parity determining information signal derived from the said fifth predetermined portion and the shape of the numerical character;
wherein said closed group of numerical characters are the numerals **1, 2, 3, 4, 5, 6, 7, 8, 9,** and **0**, said four sensing elements being substantially colinear and being consecutively designated **3, 4, 5,** and **6**, said elements sensing and converting said numerals into four-bit digital numbers in accordance with the following table:

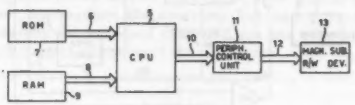
Numerals	Elements 4	5	6	3
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1
0	0	0	0	0.

3,938,187

SYSTEM FOR PUTTING AN INFORMATION RECORD ONTO A MAGNETIC SUBSTRATE

Angelo Subrizi, and Ettore Violino, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed July 9, 1974, Ser. No. 486,873
Claims priority, application Italy, July 13, 1973, 69104/73
Int. Cl.² G06F *3/06*
U.S. Cl. 340—172.5 **9 Claims**



1. System for recording an information character onto a magnetic substrate comprising a first memory for storing a microprogram adapted to control said record operation, a second memory for storing said character, a central unit conditioned by said microprogram for reading said character out of said second memory, and a record device for recording said character onto said magnetic substrate, wherein a peripheral control unit responsive to predetermined decoded microinstructions provided by said central unit for providing corresponding record signals to said record device, said central unit comprising means for cyclically transmitting said predetermined microinstructions to said peripheral control unit at fixed time intervals, a register for storing in corresponding cells the bits of the character to be recorded, means for sequentially sensing each of said cells substantially in the middle of said fixed time intervals and means controlled by said sensing means for selectively sending said predetermined microinstructions to said peripheral control unit in coincidence with sending said bits to said record device.

3,938,188

ANALOG TO DIGITAL CONVERTER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles H. Lucas, Glendora, Calif.

Filed Aug. 27, 1974, Ser. No. 501,011
Int. Cl.² H03K *13/06*
U.S. Cl. 340—347 AD **20 Claims**

1. An analog to digital converter for digitizing an analog input voltage to an N-bit digital number where N is an integer, comprising:
input means for receiving the input voltage to be digitized;
an amplifier for providing an output voltage which is a function of the difference between first and second voltages applied thereto, amplified by a factor 2^B where B is an integer greater than one;
a sign detector connected to said amplifier for providing first and second signals when the amplifier output voltage is of first and second polarities, respectively, said ampli-

fier output being of said first polarity when said first voltage is not less than said second voltage and of said second polarity when said first voltage is less than said second voltage;

control means for defining first and second conversion steps;

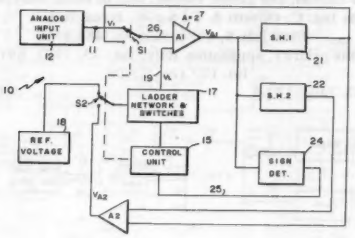
first and second voltage storage means coupled to said amplifier and selectively actuatable to store the output voltage thereof;

a source of reference potential;

digital-to-analog converter means including a B-bit up-down counter coupled to said control means and to said sign detector, for applying said second voltage to said amplifier as a function of the states of said B bits of said counter;

means for applying said reference potential to said digital-to-analog means during said first step;

means for applying said input voltage to said amplifier as said first voltage during said first step;



first successive approximation means coupled to said sign detector, said control means and said up-down counter for successively approximating the states of said B bits during a first portion of said first step as a function of the signals from said sign detector;

means for stepping the count in said counter by one during each of second and third portions of said first step following said first portion so as to decrease the difference between said first and second voltages, and for storing the amplifier output after said second portion in either said first storage means or said second storage means when said amplifier output voltage is either of said first polarity or said second polarity, respectively, and for storing the amplifier output voltage in the other storage means after the third portion of said first step; and

buffer means of at least B+C bits, for receiving in the first higher order B bits thereof the states of the B bits of said working counter, B+C being not less than N.

3,938,189

SYSTEM FOR RECORDING AND PLAYING BACK INDIVIDUAL FRAMES OF VIDEO AND RELATED AUDIO SIGNALS

Peter C. Goldmark, Stamford, Conn., assignor to Goldmark Communications Corporation, Stamford, Conn.

Filed Oct. 13, 1972, Ser. No. 297,180
Int. Cl.² H04N *5/79*
U.S. Cl. 360—8 **26 Claims**

1. An apparatus for recording and playing back video and associated audio signals for display and sound projection on a television display comprising

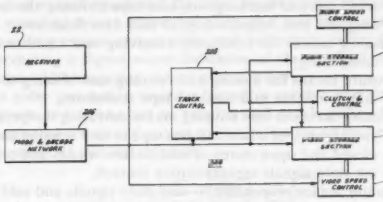
means including a magnetic storage medium for recording and playback audio signals;

means for moving the magnetic storage medium at a first high operating speed to record audio signals and at a second low operating speed for playback of the audio signal;

a magnetic video frame storage loop having a length selected to produce video frame signals for frame display on a conventional television receiver upon continuous rotation of the loop;

means for sensing signals which identify a video frame and producing video start and video end signals respectively indicative of the beginning and end of a video frame;

means actuated by the video start and end signals to store a video frame on said loop;



means for sensing audio pilot signals recorded on the magnetic medium along with the audio signals to identify an audio frame and producing an audio end signal indicative of the end of the audio frame;

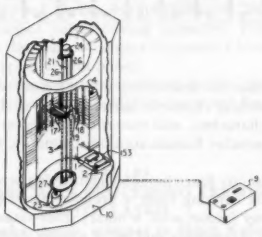
means responsive to the audio end signal for initiating the playback of another viewo frame and the playback of audio signals associated with said other video frame.

3,938,190

STORAGE AND RETRIEVAL SYSTEM FOR MAGNETIC TAPE CASSETTES

John Leonard Semmlow, Chicago, Ill., and Lawrence Stark, Berkeley, Calif., assignors to Direct Access Corporation, Berkeley, Calif.

Filed Aug. 15, 1974, Ser. No. 497,563
Int. Cl.² G11B *15/68, 23/04, 15/18, 19/08*
U.S. Cl. 360—72 **23 Claims**



1. A system for storing and retrieving information contained within discrete information-bearing modules, comprising:

a. a fixed storage area for storing a plurality of discrete information-bearing modules in a two-dimensional array, each of said modules having a designated location within said array;

b. a fixed processing station remotely situated from said fixed storage area for extracting information from individual modules;

c. a movable selection mechanism having three degrees of freedom for retrieving an individual module from said storage area and for transferring it to said fixed processing station and for restoring the same to its designated position within said storage area after information has been extracted therefrom;

d. memory means remote from said storage area for storing a predetermined schedule of modules to be sequenced through said fixed processing station;

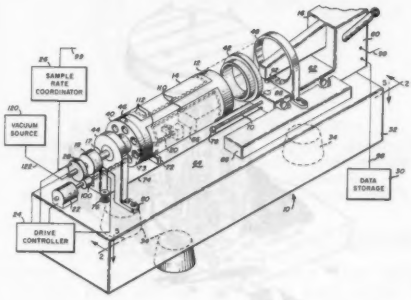
e. input means for enabling said predetermined schedule of modules to be entered in said memory means;
f. means for automatically controlling said selection mechanism to sequentially retrieve, process and restore modules according to said fixed predetermined schedule stored in said memory means; and
g. additional means for initializing each information-bearing module before next being processed at said fixed processing station.

3,938,191

ROTARY DATA BASE WITH AIR BEARING

Howard I. Jarmy, San Francisco, Calif., assignor to The Singer Company, New York, N.Y.

Filed Aug. 21, 1974, Ser. No. 499,339
Int. Cl.² G11B 70/08
U.S. Cl. 360—102 **21 Claims**



1. A system for reading an original data base and new data base, comprising:
an annular member adapted to retain the original data base;
means for rotatably supporting the annular member;
rotary drive for turning the annular member on the bearing means about an axis of rotation;
scanning member for illuminating and reading the original data base;
traverse drive for establishing relative traverse motion between the members parallel to the axis of rotation by moving at least one of the members;
guide means for retaining the members in parallel relationship during the traverse motion;
drive controller for coordinating the rotary drive and traverse drive to scan the desired area of the original data base and establish the desired format of the new data base; and
air bearing means for spacing the traversely movable member from the guide means during the traverse motion for reducing the friction and vibration coupling therebetween.

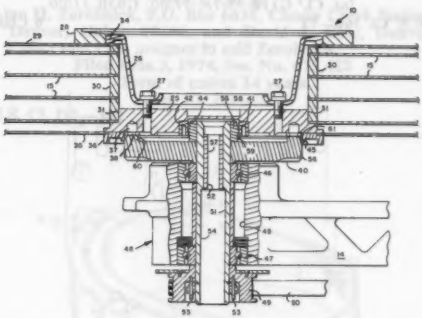
3,938,192

METHOD OF MANUFACTURING A SPINDLE ASSEMBLY FOR A DISC DRIVE

Robert H. Caletti, Menlo Park, Calif., assignor to Information Storage Systems, Inc., Cupertino, Calif.

Continuation of Ser. No. 441,172, Feb. 11, 1974, abandoned.
This application May 27, 1975, Ser. No. 580,762
Int. Cl.² G11B 25/04, 17/26, 19/20
U.S. Cl. 360—133 **3 Claims**

1. A method for manufacturing a spindle assembly for use in a disc drive apparatus having a baseplate and utilizing a disc pack having centering surfaces formed by inwardly facing insert members in a central opening in the bottom thereof and having horizontal support surfaces spaced radially outward from the central opening, said method comprising the steps of:
forming an elongated central drive shaft having first and second ends with the first end being adapted for attachment to a drive means;
fixing a hardened centering hub to the second end of the drive shaft; and



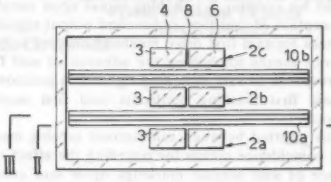
fixing a hardened support plate to the drive shaft at a position intermediate the centering hub and drive means whereby the hardened centering hub and support plate will contact and support the disc pack.

3,938,193

MAGNETIC TRANSDUCER HEAD HAVING AN INTEGRAL MAGNETIC SHIELD AND WEAR INDICATOR

John Ebenezer Sargunar, Glenrothes, Scotland, assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 27, 1974, Ser. No. 527,895
Claims priority, application United Kingdom, Mar. 15, 1974, 11609/74
Int. Cl.² G11B 5/22, 5/28, 5/115
U.S. Cl. 360—137 **8 Claims**



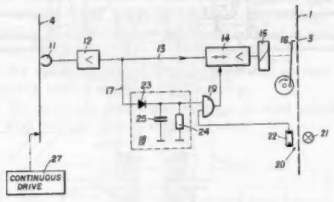
1. A magnetic transducer head assembly comprising a magnetic head including a magnetic core defining a pair of pole faces and a gap therebetween, the pole faces being subject to wear during use with respect to a recording medium, and a magnetic shield of magnetic material disposed adjacent to said magnetic core for shielding same, said magnetic shield being electrically-conductive and including a pair of terminals electrically connected together only by a bridging portion aligned with the pole faces and subject to wear therewith so that the electrical continuity between said terminals is interrupted upon the interruption of said bridging portion occurring upon a predetermined amount of wear of the pole faces, said terminals being connectable to an electrical monitoring device for monitoring the electrical continuity of said shield bridging portion and thereby for providing an indication of the occurrence of the predetermined amount of wear.

3,938,194

METHOD OF AND APPARATUS FOR OBTAINING SYNCHRONOUS MOVEMENT BETWEEN TWO MEDIA

Otto Freudenschuss, Vienna, Austria, assignor to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Filed Oct. 30, 1973, Ser. No. 411,063
Claims priority, application Austria, Oct. 31, 1972, 9255/72
Int. Cl.[2] G11B *15/18, 31/00*; G03B *31/00*
U.S. Cl. 360—71 6 Claims



1. In an apparatus having means for simultaneously processing two independently movable recordbearing stips, in combination:

first drive means for intermittently advancing a first record strip provided with at least one first marking;

second drive means for continuously advancing a second record strip provided with a sequence of second markings having a discontinuity in a zone entering the processing means substantially simultaneously with a part of said first strip identified by said first marking;

first sensing means for detecting said first marking on said first strip and emitting a first output signal in response thereto;

second sensing means for detecting said second markings on said second strip and emitting a series of second output signals in response thereto, said first drive means being connected to said second sensing means for actuation by said second output signals to step said first strip in response to said second markings;

coincidence means connected to said first and second sensing means for emitting a switching signal upon simultaneous reception of said first and second output signals;

control means for said first drive means connected to said coincidence means for halting the advance of said first strip in response to said switching signal in a position in which said first marking confronts said first sensing means; and

delay means inserted between said second sensing means and said coincidence means for retarding the effect of a recurrence of said second markings upon said coincidence means, thereby enabling renewed actuation of said first drive means by said second output signals in response to the second markings which follow said discontinuity.

3,938,195

8-TRACK - FAST FORWARD MECHANISM

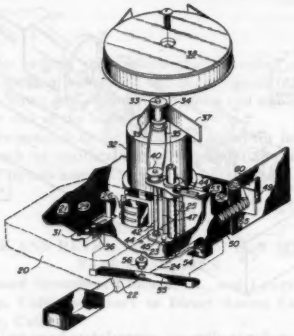
Gary P. Fukayama, Roselle, Ill., assignor to Motorola, Inc., Chicago, Ill.

Filed Sept. 26, 1974, Ser. No. 509,521
Int. Cl.[2] G11B *15/28, 15/48, 19/26, 25/06*
U.S. Cl. 360—93 9 Claims

1. In a magnetic tape cartridge having a housing with an opening adapted to receive an exchangeable cartridge having magnetic tape thereon, and a transducer head positioned to be adjacent the tape in the cartridge for cooperating therewith, the combination including:

a play capstan mounted in the housing for engagement with a pressure roller in the cartridge to drive the magnetic tape past the transducer head,

drive means mounted in the housing including a tape drive motor operatively connected to said capstan for rotating said capstan,



fast forward means selectively engageable with said drive means, and having means adapted to engage the pressure roller in the cartridge to move the same,

bracket means mounted in the housing for providing support for said fast forward means, said bracket means being movable between a first position wherein said fast forward means is disengaged from said drive means when the cartridge is in the play position against said capstan and a second position wherein said fast forward means is engaged by said drive means and said means thereof is positioned to thereby engage the pressure roller in the cartridge when the cartridge is out of the play position to advance the magnetic tape therein, and

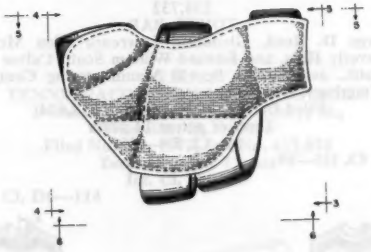
actuating means operatively connected to said bracket means to move the same between said first position wherein said fast forward means is disengaged from said drive means and said second position wherein said fast forward means is engaged by said drive means to advance the magnetic tape in the cartridge.

DESIGNS

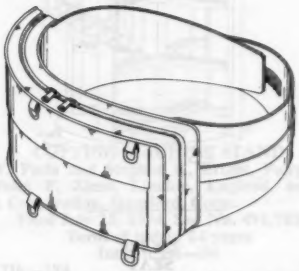
FEBRUARY 10, 1976

238,723
TONGUE FOR A SHOE
Horst R. Dassler, Eckartswiller, France, assignor to Adidas
Original design application Aug. 21, 1973, Ser. No. 390,186, which is a division of design application Ser. No. 190,435, Oct. 18, 1971, now Patent No. 231,281. Divided and this application Aug. 16, 1974, Ser. No. 498,130
Claims priority, application France Apr. 23, 1971
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—315

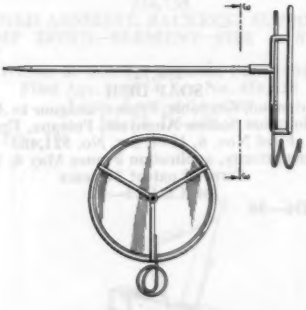
238,724
PROTECTIVE HAND CUSHION
Walter J. Kanicki, 2011 3rd St., Bay City, Mich. 48706
Filed Apr. 4, 1974, Ser. No. 457,775
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—361



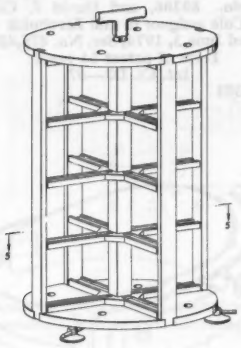
238,725
BELT PACK
Alan H. Zerobnick, P.O. Box 6638, Cherry Creek Station, Denver, Colo. 80206, and David J. Cole, Denver, Colo.; said Cole assignor to said Zerobnick
Filed June 3, 1974, Ser. No. 475,422
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—381



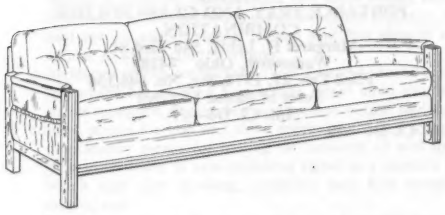
238,726
PORTABLE TRAY AND GLASS HOLDER COMBINATION
Margaret H. Labik, 540 Bird St., Wadsworth, Ohio 44281
Filed Feb. 27, 1974, Ser. No. 446,136
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—20



238,727
DISPLAY STAND OR SIMILAR ARTICLE
Clive St. John Rumble, 47 Orchard Court, Portland Square, London W. 1, England
Filed Oct. 12, 1973, Ser. No. 406,179
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24

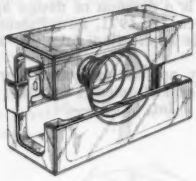


238,728
SEAT
Stanley P. Nash, Rte. 1, Riverhill Drive, Johnson Creek, Wis. 53038
Filed Feb. 11, 1974, Ser. No. 440,980
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63

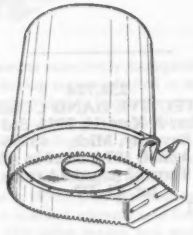


238,729
SOAP DISH
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,483
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

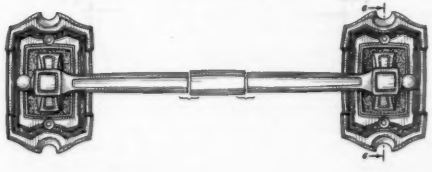
238,730
DISPENSER FOR SHEETS OF TOILET PAPER
Guy Vrignaud, Grenoble, France, assignor to Allibert Exploitation Societe Anonyme, Puteaux, France
Filed Nov. 6, 1974, Ser. No. 521,482
Claims priority, application France May 6, 1974
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—96



238,731
CONTAINER FOR PAPER ROLLS
Carl-Arne Breger, Malmo, Sweden, assignor to Kooperativa Forbundet Fack, Stockholm, Sweden
Filed Nov. 14, 1974, Ser. No. 523,822
Claims priority, application Sweden May 15, 1974
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—97

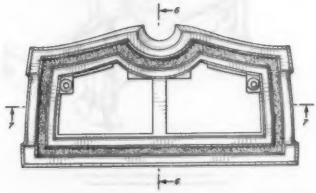


238,732
TOWEL BAR
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Oct. 15, 1974, Ser. No. 514,634
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—99

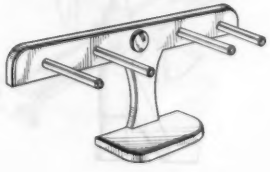


238,733
TOWEL RING
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Oct. 15, 1974, Ser. No. 514,843
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—99

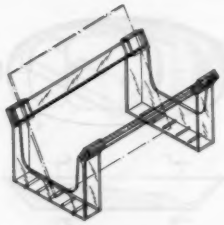
238,734
BATHROOM BRACKET FOR SOAP DISH OR TOOTHBRUSH HOLDER
George D. Read, Glendora, Lawrence Glen McCain, Beverly Hills, and Edward William Scott, Culver City, Calif., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Oct. 15, 1974, Ser. No. 514,844
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—103



238,735
TENNIS RACQUET HOLDER AND SHELF
Donald C. Trieschmann, 615 Cherry St., Winnetka, Ill. 60093
Filed Nov. 21, 1973, Ser. No. 417,878
Term of patent 7 years
Int. Cl. D6—*06*
U.S. Cl. D6—114



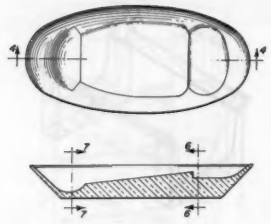
238,736
RECORD ALBUM HOLDER
Martin A. Jaffe, Bronx, N.Y., assignor to Crestmark Industries, Bayonne, N.J.
Filed Oct. 4, 1974, Ser. No. 512,050
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—185



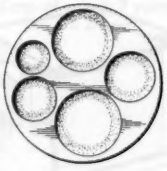
238,737
COPYING MACHINE STAND
Jacob W. Patla and Stephen K. Bright, Fairport, N.Y., and John F. Zinni, London, England, assignors to Xerox Corporation, Stamford, Conn.
Filed July 25, 1974, Ser. No. 491,703
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186

238,738
COMBINED ARMREST, BACKREST SUPPORT AND CLAMP DOWN ELEMENT FOR A STADIUM SEAT
Wilmer R. Schultz, Emmaus, Pa. 18049
Filed Apr. 1, 1974, Ser. No. 456,635
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—194

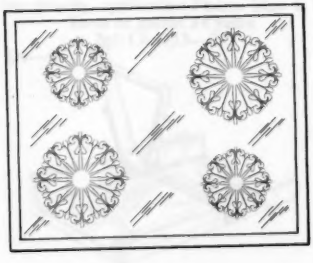
238,739
SPAGHETTI DISH
John D. Thomas, 315 W. Peck St., Negaunee, Mich. 49866
Filed Oct. 18, 1974, Ser. No. 516,036
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—1



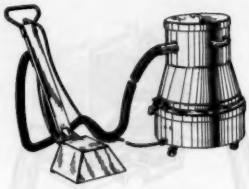
238,740
TRAY
Richard E. R. Cone, Dallas, Tex., assignor to Plastics Manufacturing Company, Dallas, Tex.
Filed Nov. 29, 1974, Ser. No. 528,472
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—27



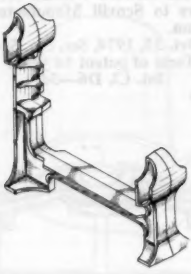
238,741
COOKING SURFACE OR THE LIKE
Jerry E. Wright, Corning, N.Y., assignor to Corning Glass Works
Filed Mar. 19, 1975, Ser. No. 559,790
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—121



238,742
FLOOR CLEANER OR SIMILAR ARTICLE
Alfred H. Brickley, Denver, Colo., assignor to Omega Tool Company, Denver, Colo.
Filed Sept. 13, 1974, Ser. No. 505,615
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—166



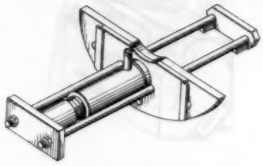
238,743
ANDIRON
James W. Welch, Bellevue, Wash. (P.O. Box 455, Lake Stevens, Wash. 98258)
Continuation-in-part of design application Ser. No. 470,178, May 15, 1974. This application Oct. 23, 1974, Ser. No. 517,207
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—211



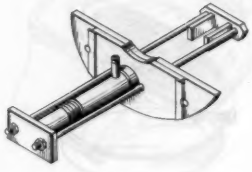
238,744
WRENCH
Masao Yoshihara, 20–3 chome, Kujyo-dori, Nishi-ku, Osaka, Japan
Filed May 13, 1974, Ser. No. 469,555
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—21

238,745
NONSKID PLASTIC WOODCUTTER'S WEDGE
Gerald R. Bedard, 419 Campbell St., Manchester, N.H. 03103, and Donald Oleniak, Squamscott Road, Stratham, N.H. 03885
Filed Dec. 13, 1974, Ser. No. 532,291
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—47

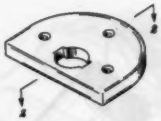
238,746
FLUID ACTUATED PULLER
Augustus J. D'Antoni, Sr., 6646 Hooper Road, Baton Rouge, La. 70811
Filed June 20, 1974, Ser. No. 481,150
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



238,747
FLUID ACTUATED PULLER
Augustus J. D'Antoni, Sr., 6646 Hooper Road, Baton Rouge, La. 70811
Filed June 20, 1974, Ser. No. 481,157
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



238,748
KEEPER PLATE FOR A DOOR CATCH
Frank Mestre, R.D. 1, Box 108, Rhinebeck, N.Y. 12572
Filed July 15, 1974, Ser. No. 488,287
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—137



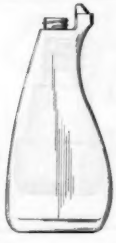
238,749
COMBINED REEL AND MOBILE STAND
Karl Johan Back and Ragnar Ilmari Olov Walhelm, Helsinki, Finland, assignors to Oy Cyklop AB, Helsinki, Finland
Filed Sept. 11, 1973, Ser. No. 396,180
Claims priority, application Finland Mar. 12, 1973
Term of patent 14 years
Int. Cl. D8—*99;* D12—*02*
U.S. Cl. D8—221

238,750
BOTTLE
Marie Joseph Coffy, Paris, France, assignor to Saint-Gobain-Desjonqueres
Filed Aug. 1, 1974, Ser. No. 493,852
Claims priority, application France Apr. 9, 1974
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—1

238,751
DISPENSING CONTAINER FOR VITAMINS OR THE LIKE
Gregory Scott MacGrossen, Manhattan Beach, Calif., assignor to Photographic Marketing Corporation of America, Hermosa Beach, Calif.
Filed Aug. 23, 1973, Ser. No. 390,886
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—18

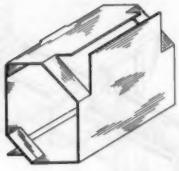
238,752
BOTTLE
Marie Joseph Coffy, Paris, France, assignor to Saint-Gobain-Desjonqueres
Filed Aug. 1, 1974, Ser. No. 493,851
Claims priority, application France Apr. 12, 1974
Term of patent 3½ years
Int. Cl. D9—*01*
U.S. Cl. D9—48

238,753
BOTTLE OR SIMILAR ARTICLE
James C. McKinney, Simpsonville, and William J. Britt and John G. Antonio, Greenville, S.C., and Sam Han, Leonia, N.J., assignors to Morton-Norwich Products, Inc.
Filed Apr. 24, 1974, Ser. No. 463,465
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60



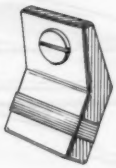
238,754
BOTTLE
Carl E. Frahm and Shirley E. Frahm, both of 1428 Oak Meadow Road, Arcadia, Calif. 91106
Filed Aug. 5, 1974, Ser. No. 494,465
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—86

238,755
PACKAGING CONTAINER
Charles K. Huff, Omaha. Nebr., assignor to Harold Mangelsen & Sons, Inc., Omaha, Nebr.
Filed Aug. 13, 1973, Ser. No. 387,683
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171

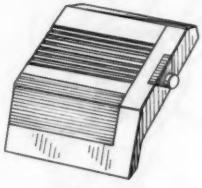


238,756
PILL CONTAINER OR THE LIKE
James B. Swett, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed July 25, 1974, Ser. No. 491,888
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D9—231

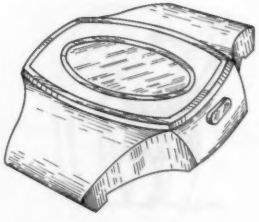
238,757
DIGITAL ELECTRONIC PENDANT WATCH
Francoise Glarner, Geneva, Switzerland, assignor to Bulova Watch Co., Inc., New York, N.Y.
Filed Aug. 15, 1974, Ser. No. 497,761
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30



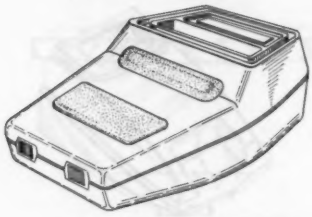
238,758
DIGITAL-DISPLAY ELECTRONIC WRISTWATCH
Marlyse Schulthess, Geneva, Switzerland, assignor to Bulova Watch Company, Inc., New York, N.Y.
Filed Aug. 15, 1974, Ser. No. 497,763
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



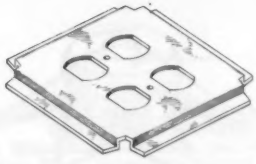
238,759
DIGITAL WRIST WATCH
Eugene Joseph Sulek, Richardson, Tex., assignor to Texas Instruments Incorporated
Filed Aug. 29, 1974, Ser. No. 501,549
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



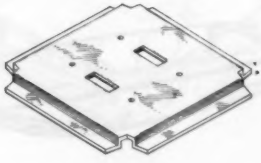
238,760
STOP WATCH CASING
Gerald Ray Daum, 14655 Coit Road, Dallas, Tex. 75240
Filed Aug. 26, 1974, Ser. No. 500,974
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—40



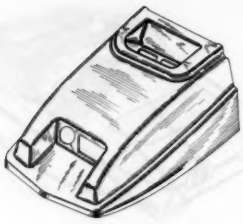
238,761
WALLPAPER TEMPLATE FOR A DOUBLE-DUAL ELECTRICAL OUTLET PLATE
John Douglass Black, 9332 Ambassador Drive, Westminster, Calif. 92683
Filed Nov. 22, 1974, Ser. No. 526,140
Term of patent 14 years
Int. Cl. D8—*09;* D19—*08*
U.S. Cl. D10—64



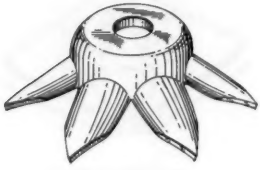
238,762
WALLPAPER TEMPLATE FOR A DOUBLE ELECTRICAL SWITCH PLATE
John Douglass Black, 9332 Ambassador Drive, Westminster, Calif. 92683
Filed Nov. 22, 1974, Ser. No. 526,141
Term of patent 14 years
Int. Cl. D8—*09;* D19—*08*
U.S. Cl. D10—64



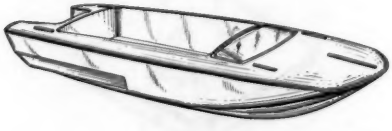
238,763
SNOWMOBILE ENGINE COWLING
Edwin B. Hatch, West Bend, Wis., assignor to Brunswick Corporation, Skokie, Ill.
Filed Mar. 13, 1974, Ser. No. 450,663
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



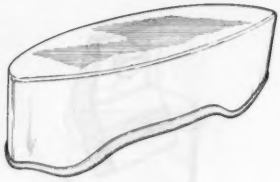
238,764
ICE STUD FOR SNOWMOBILE TRACKS
Roger G. Janssen, Rte. 2, Crookston, Minn. 56716, and Wayne G. Schantzen, 201 S. Crocker, Thief River Falls, Minn. 56701
Filed May 6, 1974, Ser. No. 467,019
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—7



238,765
MOTOR BOAT BODY
Kalman Szabadi, Vac, Hungary, assignor to Novex Talalmanyfejleszto es Ertekesito, Budapest, Hungary
Filed Sept. 4, 1974, Ser. No. 503,485
Claims priority, application Hungary Mar. 6, 1974
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62

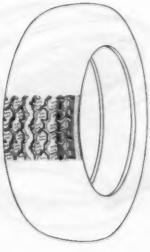


238,766
MOTORCYCLE ACCESSORY HOUSING
David J. Fritts and Faye B. Fritts, both of 3422 Caracas Drive, Mesquite, Tex. 75149
Filed Oct. 3, 1974, Ser. No. 511,583
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—114



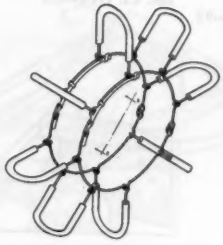
238,767
TIRE
Yvon Maurice Dartois, Bois-Colombes, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes
Filed Oct. 9, 1973, Ser. No. 404,321
Claims priority, application France June 28, 1973
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—136

238,768
TIRE
Daniel Dubos, Asnieres, France, assignor to Pneumatiques Caoutchouc Manufacture et Plastiques Kleber Colombes
Filed Jan. 13, 1975, Ser. No. 540,344
Claims priority, application France Oct. 2, 1974
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146

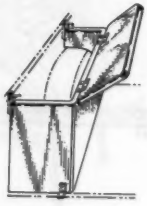


238,769
TIRE HOLDER FOR HOLDING PNEUMATIC TIRE ON A WHEEL RIM
Borje Christer Carl-Gustav Victor, Trelleborg, Sweden, assignor to Trelleborgs Gummifabriks AB, Trelleborg, Sweden
Filed Sept. 5, 1974, Ser. No. 503,546
Claims priority, application Sweden Mar. 11, 1974
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—153

238,770
DEMOUNTABLE TRACTION BOOSTER FOR MOTOR VEHICLE TIRES
Leonard Leslie Lewis, 35 Carroll St., Poughkeepsie, N.Y. 12601
Filed July 22, 1974, Ser. No. 490,504
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—154



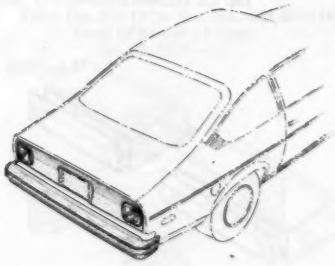
238,771
COVERED STORAGE PARTITION FOR STATION WAGONS
Albin J. Spokus, Sr., 1121 Fairwood Ave., Sunnyvale, Calif. 94086
Filed July 8, 1974, Ser. No. 486,481
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



238,772
BUMPER FOR TRUCKS
Ted L. Cline, Rush Springs, Okla., assignor to Cline Industries
Filed Oct. 25, 1974, Ser. No. 517,869
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

238,773
BUMPER FOR TRUCKS
Ted L. Cline, Rush Springs, Okla., assignor to Cline Industries
Filed Oct. 25, 1974, Ser. No. 517,873
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169

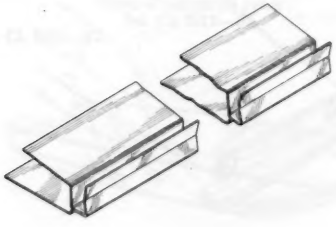
238,774
COMBINED BUMPER, REAR PANEL AND TAILLIGHT ASSEMBLY
Henry G. Haga, Bloomfield Hills, and Jerry P. Palmer, Royal Oak, Mich., assignors to General Motors Corporation
Filed Feb. 22, 1974, Ser. No. 444,864
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—170



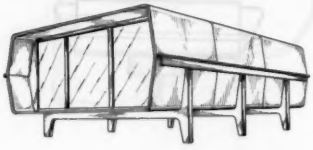
238,775
WHEEL COVER
Norman Earl Whitinger, 2117 S. Fawn Drive, Spokane, Wash. 99206
Filed Jan. 6, 1975, Ser. No. 538,761
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—212

238,776
GRATING
Ronald McKenzie Howells, Yennora, New South Wales, Australia, assignor to Comalco (J & S) Pty. Limited
Filed Nov. 6, 1972, Ser. No. 304,107
Claims priority, application Australia June 8, 1972
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 J

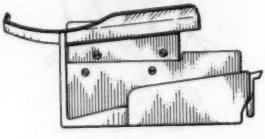
238,777
GUTTER FOR BUILDINGS
Raymond Rodney McSherry-Rhoades, 72 Jenkins Grove, Copnor, Portsmouth, Hampshire, England
Filed Sept. 11, 1973, Ser. No. 396,304
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 H



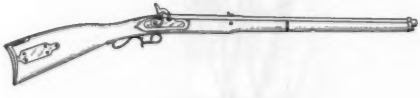
238,778
MODULAR BUILDING
Berne A. Watkins, 76 Cambridge Road, Glenmont, N.Y. 12077
Filed Nov. 16, 1973, Ser. No. 416,718
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



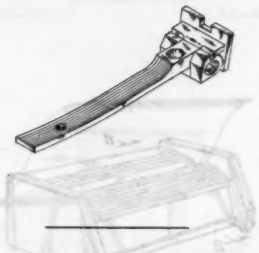
238,779
DOCUMENT TRAY
Donald A. Robertson, Fairport, and Craig A. Smith, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 8, 1974, Ser. No. 495,604
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—92



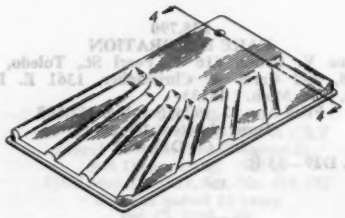
238,780
AIR RIFLE
S. Jack Hillock, Naucalpan de Juarez, Mexico, assignor to Ultra-Hi Products Co. Inc., Hawthorne, N.J.
Filed Nov. 26, 1974, Ser. No. 527,256
Term of patent 14 years
Int. Cl. D22—*01*
U.S. Cl. D22—6



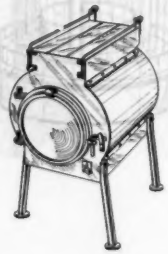
238,781
GUN SIGHT
Austin Behlert, 550 Boulevard, Kenilworth, N.J. 07033
Filed Oct. 29, 1974, Ser. No. 518,597
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D22—8



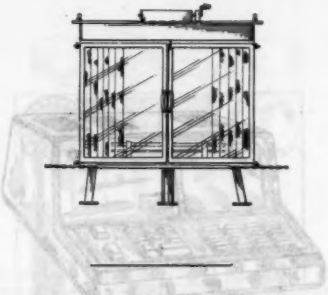
238,782
AQUARIUM FILTER BASE
Roth K. Christopherson, 5404 Plaza, Wichita, Kans. 67208
Filed Nov. 4, 1974, Ser. No. 520,744
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—4



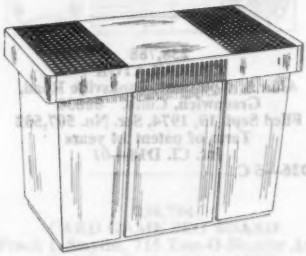
238,783
COMBINATION STOVE AND HEATER
Peter Kilham, Barrington, R.I., assignor to Droll Yankees, Inc.
Filed May 13, 1974, Ser. No. 469,335
Term of patent 14 years
Int. Cl. D23—*03, 05*
U.S. Cl. D23—97



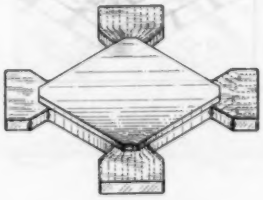
238,784
FIREPLACE OR SIMILAR ARTICLE
Donald L. Wescott, Rte. 12, Sherburne, N.Y. 13460
Filed Dec. 30, 1974, Ser. No. 537,437
Term of patent 7 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



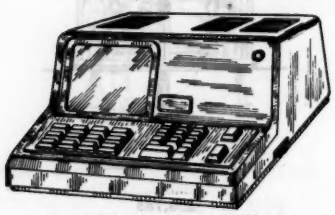
238,785
COOL VAPOR HUMIDIFIER
Andrew J. Alger, Chicago, Ill., and Eugene R. Luedtke, Reedsburg, Wis., assignors to Gerber Products Company, Freemont, Mich.
Filed Jan. 29, 1975, Ser. No. 545,247
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—146



238,786
CIRCUIT MOUNTING PACKAGE
David Nixen, Anaheim, and Thomas T. Chen, Yorba Linda, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.
Filed Jan. 24, 1974, Ser. No. 436,304
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1 R

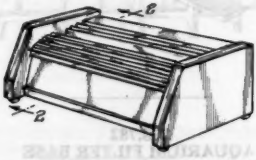


238,787
CATHODE RAY TUBE TERMINAL DEVICE OR SIMILAR ARTICLE
James R. Ferrara, Poundridge, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.
Filed May 10, 1974, Ser. No. 468,780
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

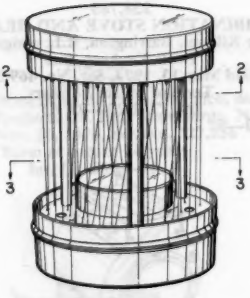


238,788
CALCULATOR
Alan B. Goldsamt, Banksville Road, Greenwich, Conn. 06830
Filed Sept. 19, 1974, Ser. No. 507,532
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D26—5 C

238,789
AMPLIFIER HOUSING
Charles A. Ross, Fort Scott, Kans., assignor to Road Electronics, Inc., Fort Scott, Kans.
Filed Dec. 16, 1974, Ser. No. 532,955
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14 G



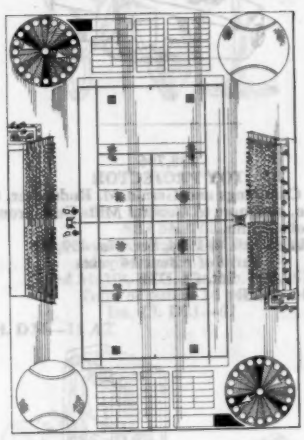
238,790
CAKE DECORATION
Katherine V. Orosz, 616 E. Pearl St., Toledo, Ohio 43608, and Carol A. Christopher, 1361 E. Rauch Road, Erie, Mich. 48133
Filed Apr. 22, 1974, Ser. No. 462,808
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 R



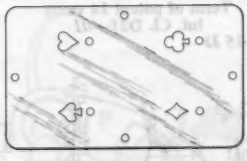
238,791
WALL PLAQUE
Donovan Worland, San Francisco, Calif., assignor to Miller Brewing Company, Milwaukee, Wis.
Filed Nov. 1, 1974, Ser. No. 519,956
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23 A

238,792
SCRATCHING POST FOR A CAT
Lionel A. White, 2305 Penrose St., San Diego, Calif. 92110
Filed May 15, 1974, Ser. No. 470,172
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—42

238,793
TENNIS GAME BOARD
James William Wallace, San Antonio, Tex., assignor to Wallace, Oxford & Bray, Inc., San Antonio, Tex.
Filed Oct. 4, 1973, Ser. No. 403,471
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 FG

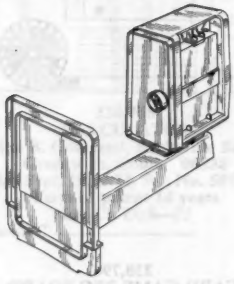


238,794
CARD GAME PEG BOARD
Frank I. Smythe, 715 Tam-O-Shanter Ave., Sun City Center, Fla. 33570
Filed Dec. 26, 1973, Ser. No. 427,463
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A

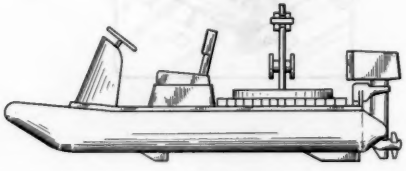


238,795
TOE FIXTURE FOR A SKI SAFETY BINDING
Noriyasu Hashioka, Tokyo, Japan, assignor to Hope Kabushiki Kaisha, Tokyo-to, Japan
Filed May 22, 1974, Ser. No. 472,384
Claims priority, application Japan Nov. 24, 1973
Term of patent 3½ years
Int. Cl. D21—*02*
U.S. Cl. D34—14 D

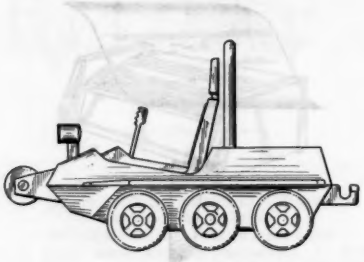
238,796
TOY PROJECTOR
Charles A. Cummings and Gerald M. Rodmaker, Cincinnati, Ohio, assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Feb. 4, 1974, Ser. No. 439,518
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



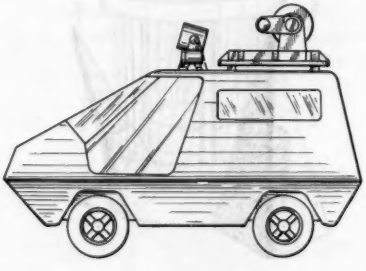
238,797
TOY BOAT
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,699
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



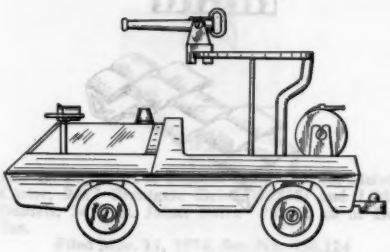
238,798
TOY VEHICLE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,707
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



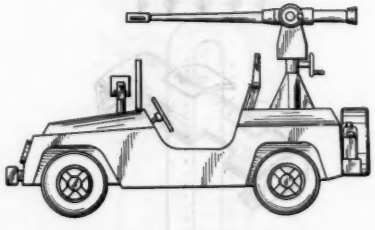
238,799
TOY VEHICLE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,708
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



238,800
TOY VEHICLE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,771
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

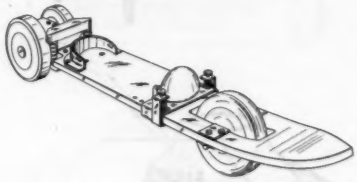


238,801
TOY VEHICLE
Adolph E. Goldfarb, 4614 Monarca Drive, Tarzana, Calif. 91345, Erwin Benkoe, 17965 Medley Drive, Encino, Calif. 91316, and Delmar K. Everitt, Woodland Hills, Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, Calif.; said Everitt, Chesley and Frierdich assignors to said Goldfarb and Benkoe
Filed Feb. 19, 1974, Ser. No. 443,857
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



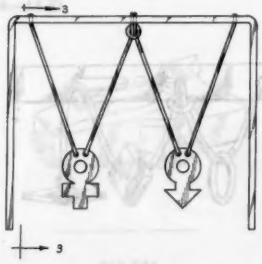
238,802
FLEXIBLE CORD AND RING PUZZLE
David L. Paige, 1682 Newfield Road, Columbus, Ohio 43209
Filed Mar. 20, 1974, Ser. No. 452,807
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M

238,803
SKI SKATE
Raymond V. Sessa, 34 Girard St., Marlboro, N.J. 07746
Filed May 9, 1974, Ser. No. 468,252
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AT

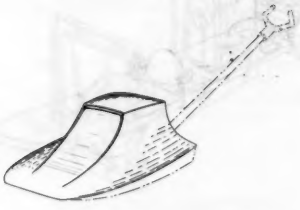


238,804
DOG TOY
John Holden, Line Ridge Farm, R.D. #1, Mount Joy, Pa. 17552
Filed July 23, 1974, Ser. No. 491,044
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 B

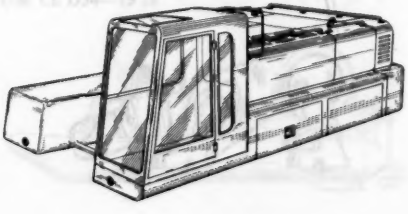
238,805
FLEXIBLE CORD AND RING PUZZLE
David L. Paige, 1682 Newfield Road, Columbus, Ohio 43209
Filed July 31, 1974, Ser. No. 493,417
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AG



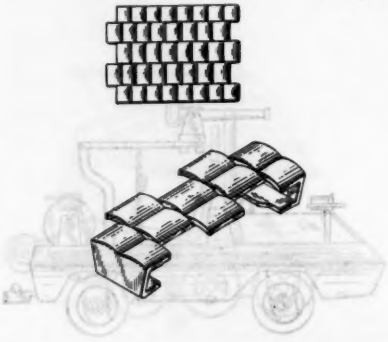
238,806
TOP HOUSING OF A WATER-SKI TOWING DEVICE
Miroslav Uroshevich, 2505 Fleetwood Ave., Cincinnati, Ohio 45211
Filed Oct. 4, 1973, Ser. No. 403,409
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D34—41



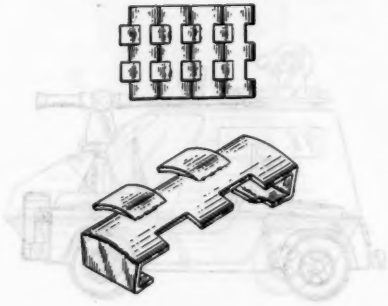
238,807
COMBINED CAB AND BODY STRUCTURE FOR AN EARTH MOVING AND HANDLING MACHINE
Bernard Jean Marie Pierre, Crepy-en-Valois, France, assignor to Poclain, Le Plessis-Belleville, Oise, France
Filed Oct. 22, 1974, Ser. No. 516,994
Claims priority, application France Apr. 23, 1974
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D40—5



238,808
CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc.
Filed Sept. 27, 1974, Ser. No. 509,844
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E



238,809
CHAIN FOR A BRACELET OR SIMILAR ARTICLE
Raymond C. Fontaine, Greenville, R.I., assignor to Textron Inc.
Filed Sept. 27, 1974, Ser. No. 510,077
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4 E



238,810
PENDANT OR SIMILAR ARTICLE
Margaretta C. Roberts, Providence, R.I., assignor to Reed and Barton Corporation, Taunton, Mass.
Filed May 28, 1974, Ser. No. 474,876
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—17

238,811
PIN
Hilary H. Ziglar, 6148 Dilbeck Lane 75240; Melvin R. Carter, 9437 Brentgate Drive 75238; and Libby S. Daniels, 3417 St. Johns Drive 75205, all of Dallas, Tex.
Filed Mar. 11, 1974, Ser. No. 450,124
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—19 N

238,812
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Edna Jeanne Fioretti, 5648 Cherry St. Extension, Erie, Pa. 16509
Filed Mar. 20, 1973, Ser. No. 342,946
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D47—5

238,813
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Francis A. Wittern, 1616 Casady Drive, Des Moines, Iowa 50315, and Arthur N. Wirstlin, 360 3rd St., SE., Altoona, Iowa 50009
Filed Apr. 27, 1973, Ser. No. 355,157
Term of patent 14 years
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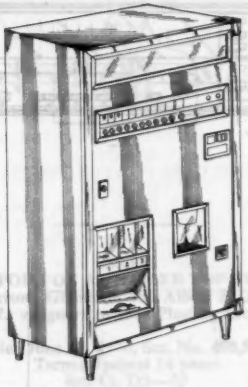
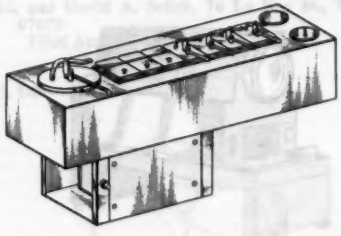
U.S. Cl. D52—3 R



238,814
COMBINED SYRUP AND FRUIT DISPENSER
Bernard L. Rothbardt, Sherman Oaks, Calif., assignor to Baskin-Robbins Ice Cream Company, Burbank, Calif.
Filed May 28, 1974, Ser. No. 474,049
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D55—1 E



238,815
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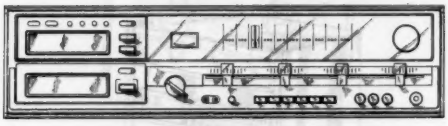
Minol Araki, Tokyo, Japan, assignor to Lloyd's Electronics, Inc., Compton, Calif.
Filed Apr. 1, 1974, Ser. No. 456,815
Term of patent 14 years
Int. Cl. D14—*01, 32*
U.S. Cl. D56—4 B



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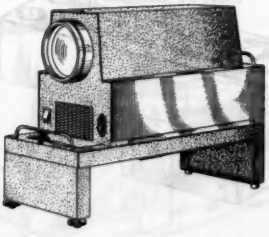
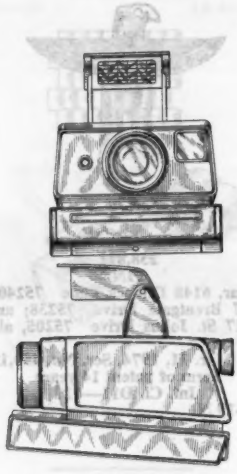
Robert Mees, Wissmar, and Heinrich Janke, Braunfels, Germany, assignors to Ernst Leitz GmbH
Filed Oct. 1, 1973, Ser. No. 402,102
Claims priority, application West Germany Apr. 13, 1973
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1 L

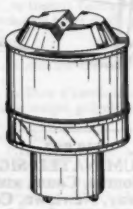


238,817
CAMERA WITH SELF-CONTAINED STROBE LIGHT
Ronald Emmerling, New City, N.Y., assignor to Berkey Photo, Inc., Paramus, N.J.
Filed Jan. 4, 1974, Ser. No. 430,936
Term of patent 14 years
Int. Cl. D03—*02*
U.S. Cl. D61—1 A

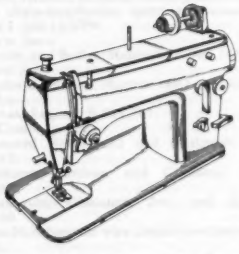


238,818
PLATEN COVER FOR COPIER
Donald A. Robertson, Fairport, and Craig A. Smith, Pittsford, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 8, 1974, Ser. No. 495,605
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q

238,819
BOTTLE COOLER
Robert Arthur Arnold, 291 Fergusson Drive, Upper Hutt, New Zealand, and Wayne Tucker Hird, 8 Gribble Grove, Stokes Valley, New Zealand
Filed Aug. 15, 1973, Ser. No. 388,420
Claims priority, application New Zealand Feb. 19, 1973
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D67—4

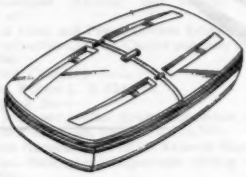


238,820
SEWING MACHINE
James F. Condran, Roselle, and George D. La Police, Somerville, N.J., assignors to The Singer Company
Filed July 17, 1974, Ser. No. 489,200
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D70—1

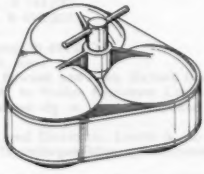


238,821
COMB HANDLE
Anthony R. Romani, Hollidaysburg, Pa. (% Antonio's Manufacturing Inc., P.O. Box 1803, Altoona, Pa. 16603)
Filed Jan. 14, 1974, Ser. No. 432,952
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—8

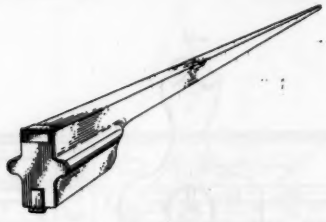
238,822
STORAGE POD FOR A TRAILER TOP OR THE LIKE
Robert L. Brison, Glendora, and Albert J. Luirette, Santa Ana, Calif., assignors to Inca Plastics, Inc., Santa Ana, Calif.
Filed June 19, 1974, Ser. No. 480,995
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



238,823
CONTAINER FOR TENNIS BALLS
Robert S. Feinberg, 81 Edgemont Place, Teaneck, N.J. 07666, and David A. Selick, 76 Le Roy St., Tenafly, N.J. 07670
Filed Aug. 16, 1974, Ser. No. 497,899
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



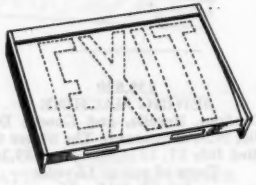
238,824
CARRYING CASE FOR FISHING POLES OR THE LIKE
John Michal, Box 7, South Prairie, Wash. 98385
Filed Aug. 23, 1974, Ser. No. 500,100
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



238,825
CARRYING CASE FOR FISHING POLES OR THE LIKE
John Michal, Box 7, South Prairie, Wash. 98385
Filed Aug. 23, 1974, Ser. No. 500,101
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R

238,826
DRY SHAVER OR SIMILAR ARTICLE
Maarten Willem van Lelyveld, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 16, 1973, Ser. No. 406,910
Claims priority, application Switzerland Apr. 16, 1973
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D95—3 A

238,827
ILLUMINATED SIGN
William P. Shine, Monroe, Conn., assignor to Dual-Lite Company, Newtown, Conn.
Filed Mar. 11, 1974, Ser. No. 449,736
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



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Class 188			
73.6	B 533,056	M	Jan. 13, 1976
165	B 567,435	M	Feb. 3, 1976
218XL	B 562,698	M	Jan. 13, 1976
Class 195			
29	B 418,489	C	Jan. 13, 1976
Class 196			
14.52	B 520,384	M	Jan. 27, 1976
Class 197			
18	B 535,391	M	Jan. 27, 1976
Class 198			
129	B 569,646	M	Jan. 13, 1976
179	B 424,989	M	Feb. 3, 1976
202	B 499,352	M	Jan. 27, 1976
Class 200			
5R	B 579,104	E	Jan. 27, 1976
11TC	B 531,425	E	Feb. 3, 1976
38FA	B 494,383	E	Feb. 3, 1976
61.41	B 506,286	E	Jan. 20, 1976
67D	B 585,247	E	Feb. 3, 1976
83SA	B 428,877	E	Jan. 27, 1976
Class 202			
227	B 513,280	C	Jan. 20, 1976
Class 204			
15	B 542,135	C	Feb. 10, 1976
159.18	B 498,205	C	Feb. 10, 1976
195S	B 843,038	C	Feb. 3, 1976
224M	B 534,314	C	Feb. 10, 1976
Class 206			
455	B 490,067	M	Jan. 27, 1976
Class 208			
15	B 437,596	C	Jan. 27, 1976
78	B 467,250	C	Feb. 3, 1976
210	B 501,317	C	Jan. 13, 1976
252	B 438,916	C	Jan. 13, 1976
Class 210			
130	B 532,901	C	Jan. 13, 1976
Class 214			
18N	B 373,344	M	Feb. 3, 1976
58	B 555,772	M	Jan. 13, 1976
152	B 480,604	M	Jan. 13, 1976
Class 215			
216	B 541,015	M	Jan. 27, 1976
Class 219			
233	B 463,388	E	Feb. 10, 1976
273	B 403,507	E	Feb. 10, 1976
Class 220			
23.83	B 529,156	M	Jan. 13, 1976
288	B 516,032	M	Jan. 27, 1976
337	B 578,447	M	Jan. 20, 1976
Class 222			
67	B 521,480	M	Jan. 13, 1976
136	B 487,260	M	Jan. 27, 1976
306	B 559,954	M	Feb. 3, 1976
325	B 515,303	M	Jan. 20, 1976
Class 228			
190	B 473,972	M	Jan. 13, 1976
Class 229			
2.5	B 537,990	M	Jan. 13, 1976
17R	B 461,257	M	Jan. 13, 1976
62.5	B 429,157	M	Jan. 27, 1976
Class 235			
151.34	B 492,946	E	Jan. 27, 1976
152	B 559,737	E	Jan. 20, 1976
154	B 534,016	E	Feb. 3, 1976
156	B 536,009	E	Jan. 27, 1976
181	B 520,924	E	Jan. 27, 1976
Class 236			
15A	B 558,813	M	Feb. 3, 1976
Class 239			
424	B 580,921	M	Jan. 13, 1976
424	B 586,215	M	Jan. 20, 1976
Class 240			
41.35R	B 454,283	E	Feb. 3, 1976
Class 242			
43R	B 521,600	M	Jan. 27, 1976
129.8	B 506,167	M	Feb. 10, 1976
Class 244			
134R	B 535,928	M	Jan. 13, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
169	B 511,346	M	Jan. 27, 1976
Class 248			
73	B 494,806	M	Feb. 3, 1976
Class 249			
135	B 548,155	M	Jan. 13, 1976
Class 250			
210	B 515,908	E	Jan. 20, 1976
227	B 522,577	E	Jan. 27, 1976
	B 560,765	E	Feb. 3, 1976
291	B 500,981	E	Jan. 27, 1976
402	B 451,534	E	Jan. 13, 1976
577	B 507,396	E	Feb. 10, 1976
Class 251			
319	B 490,589	M	Feb. 3, 1976
Class 252			
182	B 471,405	C	Feb. 10, 1976
301.4S	B 535,813	C	Jan. 27, 1976
364	B 370,309	C	Jan. 20, 1976
429R	B 457,850	C	Feb. 10, 1976
454	B 450,967	C	Jan. 13, 1976
518	B 585,731	C	Feb. 3, 1976
543	B 403,766	C	Feb. 10, 1976
Class 254			
186R	B 511,407	M	Feb. 10, 1976
188	B 437,559	M	Feb. 3, 1976
Class 259			
191	B 556,057	M	Jan. 13, 1976
Class 260			
2.5AC	B 497,194	C	Feb. 3, 1976
	B 537,102	C	Jan. 13, 1976
2.5AJ	B 557,856	C	Feb. 10, 1976
2.5AM	B 422,063	C	Feb. 3, 1976
2.5AR	B 483,606	C	Jan. 27, 1976
	B 502,589	C	Jan. 27, 1976
2.5AV	B 460,441	C	Jan. 13, 1976
2.5AW	B 483,762	C	Feb. 10, 1976
2.5R	B 471,579	C	Jan. 13, 1976
17R	B 510,998	C	Feb. 10, 1976
18TN	B 528,303	C	Feb. 10, 1976
23XA	B 483,865	C	Jan. 13, 1976
28.5AS	B 501,540	C	Jan. 13, 1976
29.2EP	B 526,997	C	Jan. 13, 1976
29.2TN	B 414,266	C	Feb. 10, 1976
33.6AQ	B 657,438	C	Jan. 20, 1976
37EP	B 441,605	C	Feb. 3, 1976
37R	B 465,955	C	Feb. 3, 1976
42.15	B 415,122	C	Feb. 10, 1976
45.75W	B 561,387	C	Feb. 10, 1976
45.8N	B 506,648	C	Feb. 3, 1976
45.85R	B 236,342	C	Feb. 10, 1976
47EP	B 440,633	C	Feb. 10, 1976
75N	B 521,125	C	Feb. 10, 1976
	B 521,126	C	Feb. 10, 1976
	B 521,128	C	Feb. 10, 1976
	B 552,489	C	Feb. 10, 1976
77.5CR	B 306,668	C	Feb. 3, 1976
78.5R	B 437,209	C	Feb. 3, 1976
88.2C	B 417,014	C	Jan. 13, 1976
112.5R	B 471,617	C	Feb. 10, 1976
	B 503,817	C	Jan. 13, 1976
140R	B 503,579	C	Feb. 10, 1976
239A	B 349,370	C	Jan. 27, 1976
239D	B 520,256	C	Jan. 13, 1976
	B 536,935	C	Jan. 13, 1976
239.1	B 538,753	C	Feb. 10, 1976
239.3A	B 506,148	C	Feb. 3, 1976
243C	B 473,039	C	Feb. 10, 1976
	B 473,040	C	Feb. 10, 1976
	B 516,047	C	Feb. 10, 1976
	B 516,296	C	Feb. 3, 1976
	B 526,096	C	Feb. 3, 1976
244R	B 348,433	C	Feb. 3, 1976
247.7T	B 468,052	C	Feb. 10, 1976
248NS	B 537,711	C	Jan. 13, 1976
250BC	B 491,883	C	Feb. 3, 1976
256.5R	B 531,096	C	Feb. 10, 1976
285.5	B 530,318	C	Jan. 13, 1976
293.54	B 545,464	C	Feb. 10, 1976
293.56	B 447,000	C	Feb. 3, 1976
294.8D	B 526,510	C	Jan. 20, 1976
295.5B	B 458,617	C	Feb. 3, 1976
296R	B 477,252	C	Jan. 13, 1976
306.7C	B 385,024	C	Feb. 10, 1976
307D	B 486,280	C	Feb. 3, 1976
308A	B 488,111	C	Jan. 13, 1976
309.2	B 542,158	C	Jan. 13, 1976
326R	B 398,084	C	Feb. 3, 1976
326.5B	B 276,026	C	Feb. 3, 1976
326.5FN	B 484,269	C	Feb. 10, 1976
326.9	B 477,481	C	Feb. 3, 1976
327C	B 480,452	C	Feb. 10, 1976
330.5	B 552,498	C	Jan. 13, 1976
343.2R	B 491,032	C	Feb. 10, 1976
343.3	B 536,675	C	Jan. 20, 1976
343.3R	B 495,550	C	Feb. 3, 1976
	B 495,554	C	Feb. 3, 1976
346.2M	B 440,858	C	Feb. 3, 1976
	B 302,160	C	Feb. 3, 1976
348.5L	B 521,324	C	Jan. 27, 1976
348.6	B 546,295	C	Jan. 20, 1976
378	B 431,713	C	Feb. 10, 1976
429.7	B 464,587	C	Feb. 3, 1976
448.2H	B 390,408	C	Feb. 3, 1976
465.5R	B 747,785	C	Feb. 10, 1976
465.9	B 456,900	C	Feb. 3, 1976
471R	B 388,521	C	Jan. 13, 1976
472	B 472,256	C	Jan. 13, 1976
513R	B 494,669	C	Feb. 3, 1976
515A	B 390,031	C	Jan. 13, 1976
516	B 386,828	C	Feb. 3, 1976
534R	B 301,143	C	Jan. 27, 1976
557R	B 386,257	C	Feb. 3, 1976
566A	B 513,014	C	Feb. 10, 1976
593R	B 468,350	C	Jan. 13, 1976
601R	B 208,916	C	Jan. 13, 1976
609E	B 474,573	C	Jan. 20, 1976
621K	B 470,348	C	Jan. 13, 1976
647	B 394,248	C	Jan. 27, 1976
648F	B 330,736	C	Feb. 3, 1976
674SA	B 426,274	C	Jan. 20, 1976
683.15D	B 428,103	C	Feb. 10, 1976
859R	B 519,485	C	Feb. 10, 1976
873	B 465,688	C	Jan. 27, 1976
876B	B 575,851	C	Feb. 10, 1976
880B	B 510,458	C	Feb. 10, 1976
884	B 456,579	C	Feb. 10, 1976
890	B 495,408	C	Feb. 3, 1976
937	B 512,373	C	Feb. 10, 1976
940	B 496,430	C	Feb. 10, 1976
942	B 386,673	C	Feb. 3, 1976
Class 261			
39A	B 562,462	C	Jan. 13, 1976
98	B 480,702	C	Jan. 27, 1976
Class 264			
36	B 308,659	C	Jan. 27, 1976
51	B 506,144	C	Feb. 10, 1976
	B 508,369	C	Jan. 13, 1976
161	B 555,437	C	Feb. 3, 1976
225	B 453,759	C	Jan. 27, 1976
Class 274			
37	B 526,388	M	Feb. 3, 1976
Class 280			
150.5	B 583,051	M	Feb. 3, 1976
236	B 572,642	M	Feb. 10, 1976
Class 293			
71P	B 552,932	M	Feb. 3, 1976
Class 296			
35R	B 463,671	M	Jan. 13, 1976
Class 298			
35M	B 510,588	M	Jan. 27, 1976
Class 305			
27	B 506,566	M	Jan. 20, 1976
Class 307			
88.3	B 540,872	E	Jan. 20, 1976
137	B 466,444	E	Jan. 20, 1976
205	B 513,368	E	Feb. 3, 1976
232	B 540,078	E	Jan. 13, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
255	B 492,688	E	Jan. 20, 1976
270	B 497,960	E	Jan. 20, 1976
293	B 519,932	E	Feb. 3, 1976
296	B 512,849	E	Feb. 3, 1976
Class 310			
9.6	B 501,482	E	Jan. 13, 1976
41	B 561,784	E	Jan. 27, 1976
155	B 592,143	C	Jan. 27, 1976
Class 313			
42	B 534,443	E	Jan. 27, 1976
60	B 513,706	M	Jan. 13, 1976
99	B 518,859	E	Feb. 3, 1976
273	B 531,929	E	Jan. 20, 1976
366	B 515,455	E	Jan. 27, 1976
404	B 523,696	E	Jan. 13, 1976
452	B 160,045	E	Jan. 13, 1976
477	B 279,969	E	Jan. 13, 1976
Class 315			
169TV	B 463,322	E	Jan. 20, 1976
371	B 483,615	E	Jan. 27, 1976
388	B 516,002	E	Jan. 13, 1976
399	B 467,971	E	Jan. 13, 1976
Class 317			
9R	B 488,634	E	Jan. 20, 1976
120	B 509,606	E	Feb. 3, 1976
259	B 506,461	E	Jan. 20, 1976
Class 318			
139	B 475,236	E	Feb. 3, 1976
231	B 511,886	E	Feb. 3, 1976
257	B 502,973	E	Jan. 27, 1976
Class 321			
2	B 533,734	E	Jan. 27, 1976
7	B 509,185	E	Feb. 3, 1976
61	B 495,759	E	Feb. 3, 1976
Class 323			
1	B 430,276	E	Jan. 20, 1976
17	B 459,811	E	Jan. 20, 1976
	B 583,089	E	Jan. 27, 1976
22T	B 501,181	E	Feb. 10, 1976
Class 324			
13	B 079,099	E	Jan. 13, 1976
51	B 534,767	E	Feb. 3, 1976
60C	B 540,218	E	Feb. 10, 1976
62	B 465,393	E	Jan. 27, 1976
Class 325			
40	B 558,220	E	Jan. 27, 1976
468	B 544,961	E	Jan. 13, 1976
Class 328			
129	B 78,315	E	Feb. 10, 1976
155	B 550,693	E	Jan. 20, 1976
Class 330			
33	B 439,542	E	Jan. 27, 1976
207P	B 553,460	E	Feb. 3, 1976
Class 331			
44ST	B 527,669	E	Jan. 13, 1976
51	B 538,686	E	Jan. 13, 1976
94.5C	B 549,931	E	Jan. 20, 1976
94.5L	B 506,916	E	Feb. 3, 1976
94.5P	B 394,350	E	Jan. 13, 1976
116R	B 527,693	E	Feb. 3, 1976
Class 333			
30R	B 453,616	E	Jan. 27, 1976
31A	B 568,770	E	Feb. 10, 1976
72	B 534,991	E	Jan. 27, 1976
73W	B 339,194	E	Feb. 3, 1976
Class 335			
210	B 541,517	E	Jan. 13, 1976
253	B 515,452	E	Feb. 10, 1976
Class 338			
166	B 489,526	E	Feb. 3, 1976
202	B 528,761	E	Feb. 10, 1976

		CAT.	PUB. DATE
Class 340			
172.5	B 461,336	E	Feb. 3, 1976
	B 482,907	E	Jan. 20, 1976
173R	B 545,945	M	Jan. 27, 1976
174DC	B 443,712	E	Jan. 27, 1976
174TF	B 429,018	C	Feb. 10, 1976
	B 455,425	E	Feb. 3, 1976
	B 476,681	E	Jan. 13, 1976
	B 499,718	E	Jan. 27, 1976
198	B 546,665	E	Jan. 20, 1976
347AD	B 507,647	E	Jan. 27, 1976
	B 526,106	E	Jan. 27, 1976
347CC	B 498,500	E	Jan. 20, 1976
Class 343			
7A	B 248,240	E	Jan. 13, 1976
7.7	B 484,029	E	Feb. 10, 1976
100LE	B 488,395	E	Jan. 27, 1976
100LE	B 496,502	E	Jan. 20, 1976
786	B 547,994	E	Jan. 20, 1976
815	B 563,244	E	Jan. 27, 1976
Class 346			
75	B 512,964	E	Feb. 10, 1976
Class 350			
96WG	B 381,985	M	Feb. 3, 1976
	B 537,722	M	Feb. 3, 1976
103	B 586,663	M	Feb. 3, 1976
173	B 469,947	M	Jan. 20, 1976
310	B 520,543	M	Jan. 27, 1976
320	B 548,440	M	Feb. 3, 1976
Class 354			
70	B 533,580	E	Feb. 3, 1976
298	B 489,328	E	Jan. 20, 1976
Class 355			
17	B 493,501	M	Feb. 3, 1976
Class 357			
16	B 496,487	E	Jan. 20, 1976
36	B 508,961	E	Feb. 3, 1976
65	B 470,798	E	Jan. 20, 1976
Class 358			
8	B 554,939	E	Feb. 10, 1976
41	B 502,289	E	Jan. 13, 1976
Class 360			
1	B 484,365	E	Jan. 27, 1976
15	B 283,941	E	Feb. 3, 1976
17	B 461,874	E	Jan. 27, 1976
27	B 427,883	E	Jan. 20, 1976
80	B 403,477	E	Feb. 3, 1976
81	B 500,176	E	Feb. 3, 1976
85	B 501,253	E	Feb. 3, 1976
130	B 579,806	E	Feb. 3, 1976
Class 401			
219	B 557,621	M	Feb. 3, 1976
Class 403			
107	B 513,789	M	Feb. 3, 1976
318	B 540,632	M	Jan. 13, 1976
Class 404			
71	B 452,672	M	Jan. 13, 1976
77	B 434,206	M	Feb. 3, 1976
Class 408			
124	B 501,993	M	Jan. 13, 1976
146	B 521,986	M	Feb. 3, 1976
Class 415			
14	B 471,735	M	Feb. 3, 1976
213R	B 512,547	M	Jan. 13, 1976
214	B 552,006	M	Feb. 3, 1976
Class 416			
61	B 549,394	M	Jan. 27, 1976
Class 423			
238	B 485,401	C	Jan. 27, 1976
315	B 471,221	C	Jan. 13, 1976
390	B 549,198	C	Jan. 13, 1976
393	B 491,455	C	Feb. 3, 1976
580	B 379,177	C	Jan. 27, 1976

NOTE.—First number, class; second number, subclass; third number, document number

		CAT.	PUB. DATE
Class 424			
9	B 426,424	C	Feb. 3, 1976
115	B 482,660	C	Feb. 10, 1976
122	B 524,179	C	Jan. 13, 1976
177	B 490,995	C	Feb. 3, 1976
203	B 576,903	C	Feb. 3, 1976
230	B 487,133	C	Jan. 27, 1976
257	B 374,588	C	Jan. 27, 1976
258	B 426,639	C	Feb. 3, 1976
263	B 466,929	C	Jan. 27, 1976
267	B 307,698	C	Feb. 3, 1976
	B 407,737	C	Feb. 3, 1976
270	B 521,711	C	Feb. 10, 1976
273	B 566,464	C	Feb. 3, 1976
274	B 496,431	C	Jan. 13, 1976
311	B 457,862	C	Jan. 27, 1976
317	B 510,850	C	Feb. 3, 1976
362	B 495,489	C	Feb. 3, 1976
Class 425			
222	B 163,463	M	Jan. 27, 1976
384	B 562,813	C	Feb. 3, 1976
Class 426			
3	B 583,712	C	Feb. 10, 1976
276	B 535,944	C	Jan. 13, 1976
535	B 560,717	C	Feb. 10, 1976
548	B 439,778	C	Feb. 3, 1976
Class 427			
39	B 476,837	C	Jan. 20, 1976
70	B 381,709	C	Jan. 13, 1976
207	B 501,415	C	Jan. 13, 1976
343	B 160,099	C	Jan. 13, 1976
372	B 409,848	C	Jan. 27, 1976
389	B 519,377	C	Jan. 27, 1976
Class 428			
73	B 481,737	C	Jan. 13, 1976
289	B 402,929	C	Feb. 3, 1976
315	B 373,354	C	Jan. 27, 1976
341	B 450,196	C	Feb. 10, 1976
434	B 457,886	C	Jan. 13, 1976
Class 431			
175	B 534,313	M	Jan. 27, 1976
264	B 398,220	M	Feb. 3, 1976

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF FEBRUARY, 1976

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.N.F. - Frangeco: *See—*
Durocher, Jean, 3,937,153.

A/S Haustrups Fabriker: *See—*
Hansen, Erik, 3,938,036.

Aardee Spring & Lock Company Limited: *See—*
McCoag, John, 3,937,507.

AB Bofors: *See—*
Eriksson, Carl-Erik, 3,937,125.

AB Carbox: *See—*
Trolle, Sten, 3,937,057.

Abbott Laboratories: *See—*
Clark, Robert Kingsbury, Jr., 3,937,813.

Abbott, Randle Leslie, to GKN Transmissions Limited. Control means. 3,937,313, Cl. 192-48.910.

Abex Corporation: *See—*
Adams, Cecil E.; and Born, Ellis H., 3,937,130.

Acker, Jesse L.; and Meserol, Peter M., to Akro-Medic Engineering, Inc. Baseline correction system for pulse trains. 3,938,049, Cl. 328-162.000.

Action Communication Systems, Inc.: *See—*
Matthews, Gordon H., 3,937,938.

Acushnet Company: *See—*
Jepson, John W.; and Allen, Earle F., Jr., 3,937,474.

Adamovske strojirny, narodni podnik: *See—*
Cerny, Arnost; and Svoboda, Jiri, 3,937,142.

Adams, Cecil E.; and Born, Ellis H., to Abex Corporation. Low friction seal assembly. 3,937,130, Cl. 92-125.000.

Adamson, Michael J.: *See—*
United States of America, National Aeronautics and Space Administration; Gilbreath, William P.; Adamson, Michael J.; and Fassbender, Alexander G., 3,938,035.

Addressograph-Multigraph Corporation: *See—*
Krulik, Gerald A.; and Sable, Harvey J., 3,937,571.

Advanced Drainage Systems, Inc.: *See—*
Gahler, Lester, 3,936,961.

Aebi, Rudolf: *See—*
Vogel, Christian; and Aebi, Rudolf, 3,937,730.

Aerojet-General Corporation: *See—*
Briar, Herman P., 3,937,070.

Aeronutronic Ford Corporation: *See—*
Seidler, Helmut G.; and Walker, James T., 3,937,980.

Aeronutronic Ford Corporation (formerly Philco-Ford Corporation): *See—*
Buhler, Frederick T., 3,938,055.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Barras, Gerard, 3,936,978.
Sevenet, Thierry; Thal, Claude; Husson, Henri Philippe; and Potier, Pierre, 3,937,709.
Thureau, Pierre; and Bremont, Michel, 3,937,599.

Agency of Industrial Science & Technology: *See—*
Kataoka, Shoei; Tsurushima, Toshio; Sugiyama, Yoshinobu; Tanoue, Hisao; Yamada, Hideo; and Komamiya, Yasuo, 3,938,110.

AGFA-Gevaert, AG: *See—*
Winkler, Alfred; Engelsmann, Dieter; and Schroder, Rolf, 3,938,170.

Agosta, Vito. Process and apparatus for obtaining the emulsification of nonmiscible liquids. 3,937,445, Cl. 259-4.00R.

Ahlgren, Joseph R., to Barber-Colman Company. Digital frequency generator. 3,937,932, Cl. 235-92.0PE.

Ahlstone, Arthur G.; and Bartos, Josef A., to Vetco Offshore Industries, Inc. Fluid pressure operated shut off valve apparatus. 3,937,251, Cl. 137-594.000.

Ahmed, Adel Abdel Aziz, to RCA Corporation. Threshold detector. 3,937,987, Cl. 307-235.00W.

Aiba, Masahiko: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 3,938,163.

Aihara, Ryuzo: *See—*
Ota, Susumu; and Aihara, Ryuzo, 3,938,001.

Ailes, Curtis: *See—*
Hoagland, Harold G., 3,937,368.

Aito, Yuzo: *See—*
Mitani, Yuji; Aito, Yuzo; Yamaguchi, Masahiro; and Nawata, Kiyoshi, 3,937,689.

Aizawa, Hiroshi: *See—*
Hosoe, Kazuya; Matsumoto, Seiichi; Yokota, Hideo; and Aizawa, Hiroshi, 3,937,950.

Ajioka, James S.; and Schaffer, Kenneth L., to Hughes Aircraft Company. Dual frequency feed horn using notched fins for phase and amplitude control. 3,938,159, Cl. 343-756.000.

Akado, Hajime; Kawashima, Yutaka; Yamaguchi, Akihide; and Matsuura, Hideki, to Nippondenso Co., Ltd. Pleated filter in the exhaust manifold. 3,937,015, Cl. 60-288.000.

Akamatsu, Mototsugu. Forming die structure. 3,937,053, Cl. 72-352.000.

Akiba, Toyoaki; Sato, Takero;; Tokuda, Makoto; and Tomono, Hiroshi, to Sumitomo Shipbuilding and Machinery Co. Ltd.; and Sumitomo Metal Industries Limited. Measuring means for measuring secondary cooling zone roller gaps in continuous casting machine. 3,937,271, Cl. 164-150.000.

Akro-Medic Engineering, Inc.: *See—*
Acker, Jesse L.; and Meserol, Peter M., 3,938,049.

Aktiebolaget Demektor: *See—*
Salmijak, Erich; and Goransson, Eric, 3,937,362.

Aktiebolaget Draco: *See—*
Wetterlin, Kjell Ingvar Leopold; and Svensson, Leif Ake, 3,937,838.

Alais, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Module for conditioning air by the peltier effect and air conditioning installations comprising such modules. 3,937,028, Cl. 62-3.000.

Alasia, Alfred V. Process of coding indicia and product produced thereby. 3,937,565, Cl. 350-320.000.

Albany International Corporation: *See—*
Benson, Richard W.; Crnak, John R.; and Ingraham, Richard G., 3,937,467.

Albert, Michael B.: *See—*
Thornton, Bruce C.; Albert, Michael B.; and Worrell, G. Richard, 3,937,747.

Alday, James Marion; and Rowlands, Kenneth Charles, to Remington Arms Company, Inc. Oscillating target throwing device with rotary magazine assembly. 3,937,204, Cl. 124-9.000.

Aledyne Corporation: *See—*
Northcutt, Michael E., 3,936,938.

Alephtran Systems Ltd.: *See—*
Hyder, Syed Salahuddin, 3,938,099.

Alex E. Clark Limited: *See—*
Masygan, Raymond Joseph, 3,938,171.

Alexander, Robert: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,937,657.

Alfieri, Richard J., executor: *See—*
Garrison, David H., Jr., deceased; and Alfieri, Richard J., executor, 3,936,990.

Alford, Booker Taliaferro, to American Cyanamid Company. Anthelmintic composition and method of use. 3,937,825, Cl. 424-217.000.

Alfter, Franz-Werner: *See—*
Wienand, Michael; Hasberg, Jurgen; and Alfter, Franz-Werner, 3,937,777.

Allaben, Charles M.: *See—*
Zimmer, George A.; Weidman, William K.; and Allaben, Charles M., 3,937,538.

Allcock, Harry Rex; Gardner, James Earl, deceased (by Gardner, Patricia, executrix); and Smeltz, Karen M., to Firestone Tire & Rubber Company, The. Use of water as a catalyst for the polymerization of chlorocyclophosphazenes. 3,937,790, Cl. 423-300.000.

Allen, Brian Robert; and Harrison, Anthony William, to Girling Limited. Friction plates. 3,937,303, Cl. 188-73.200.

Allen, Clayton H. Noise suppression. 3,937,102, Cl. 74-569.000.

Allen, David Thomas: *See—*
Lange, Henry James; McCunn, Myron Lee; Berk, Martin Adolph; Classen, Peter Jay; and Allen, David Thomas, 3,938,016.

Allen, Earle F., Jr.: *See—*
Jepson, John W.; and Allen, Earle F., Jr., 3,937,474.

Allen, Phillip E., to Structural Fibers, Inc. Method for forming fiber-reinforced plastic articles. 3,937,781, Cl. 264-314.000.

Allied Chemical Corporation: *See—*
Gancy, Alan Brian; and Wamser, Christian Albert, 3,937,785.
Loomba, Yogendra S., 3,937,258.
Moore, William Percy; and Hundtofte, Virgil Anton, 3,937,734.
Vermeer, Dick Charles; and Biron, Raymond Joseph, 3,936,917.
Wamser, Christian A.; and Bruen, Charles P., 3,937,783.

Allied Resin Corporation: *See—*
Wiley, Paul J.; and Davis, Robert, 3,937,774.

Alling, Richard Lassen; and Woiten, Richard John, to Torrington Company, The. Thrust washer. 3,937,541, Cl. 308-235.000.

Allison, Donn, to Allison, Donn. Light fixture. 3,937,948, Cl. 240-78.00R.

Allmanna Svenska Elektriska Aktiebolaget: *See—*
Nilsson, Lars-Olof; Soderberg, Bo; and Schmiterlow, Fredrik, 3,937,152.

Alpha Chemicals (Australia) Pty. Limited: *See—*
Rosicky, Jan, 3,937,613.

Alpha Romeo S.p.A.: *See—*
Garcea, Giampaolo; Police, Gennaro; and Ciccarone, Angelo, 3,937,766.

Alvarez-Calderon F., Alberto M. Inflatable envelope systems for use in excavations. 3,937,025, Cl. 61-35.000.

Alwes, Dieter; Eckardt, Helmut; Leiste, Hans Peter; and Melcher, Robert Albert, to Siemag Siegener Maschinenbau GmbH. Injection molding apparatus. 3,937,447, Cl. 259-191.000.

Amcel Europe, S.A.: *See—*
Schiffer, Heinz, 3,936,996.

American Cyanamid Company: *See—*
Alford, Booker Taliaferro, 3,937,825.
Roth, Roy William, 3,937,223.

American District Telegraph Company: *See—*
Galvin, Aaron A.; and Shapiro, L. Dennis, 3,938,118.

American/Durein Company: *See—*
Schueler, Marlin A., 3,937,377.

American Hoechst Corporation: *See—*
Horner, Ellwood J., 3,937,175.

American Home Products Corporation: *See—*
Fletcher, Horace; Malis, Jerry L.; and Yardley, John P., 3,937,818.
Freed, Meier E.; and Potoski, John R., 3,937,736.
Lippmann, Wilbur, 3,937,801.
Sarantakis, Dmitrios, 3,937,695.
Sellstedt, John H.; and Klaubert, Dieter H., 3,937,719.
Strike, Donald P.; Kao, Wenling; and Fenichei, Richard L., 3,937,839.

American Safety Equipment Corporation: *See—*
Henderson, Cyril, 3,937,416.

American Videonetics Corporation: *See—*
Vogel, Charles A.; and Lombardi, William T., 3,937,411.

Amery, John Gordon, to RCA Corporation. Comb filter for video processing. 3,938,179, Cl. 358-4.000.

Amey, John N.; and Ivester, Andrew S., to Polaroid Corporation. Film catcher. 3,938,167, Cl. 354-86.000.

AMP Incorporated: *See—*
Brummett, Charles Roscoe; Shaak, Ray Ned; and Andrews, Daniel Marshall, 3,937,857.
Dittmann, Larry Eugene, 3,937,548.
Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,936,933.
Hansen, Niels Junior; and Capp, Ronald James, 3,938,177.
Hughes, Donald Kent, 3,937,549.
Lawson, Gustaf Rudolph, 3,937,403.

Ampex Corporation: *See—*
Louth, Kenneth; and Oldershaw, Reginald William, 3,938,041.

Amsen, Willem Hendrik; and Hovens, Paulus Joseph Maria, to U.S. Philips Corporation. Picture display apparatus including a line phase discriminator for generating a control voltage. 3,937,876, Cl. 178-7.30R.

Amundsen, Hyrum J., Jr. Electrical brush contact. 3,937,542, Cl. 339-3.00R.

Anchor Hocking Corporation: *See—*
Shank, Herbert C., Jr., 3,937,853.
Shank, Herbert C., Jr., 3,937,854.
Shonebarger, Francis J.; and Brown, William, 3,937,676.

Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. Apparatus for connecting and sealing together two lengths of cylinder barrel of a worm extruder. 3,937,495, Cl. 285-41.000.

Anderson, Alfred F. Collapsible liquid container for use with plastic liners. 3,937,363, Cl. 222-105.000.

Anderson, Arthur W.: *See—*
Han, Youn W.; and Anderson, Arthur W., 3,937,845.
Han, Youn W.; Pence, James W.; and Anderson, Arthur W., 3,937,849.

Anderson, Martha A.; and Anderson, Robert M. Elevator means for the chair seat of a convertable wheel chair and bed. 3,936,893, Cl. 5-81.00R.

Anderson, Max F. Log splitter. 3,937,260, Cl. 144-193.00A.

Anderson, Robert M.: *See—*
Anderson, Martha A.; and Anderson, Robert M., 3,936,893.

Anderson, Ronald W., to Prenihan A.G. One-piece panty and stockings. 3,937,039, Cl. 66-177.000.

Anderson, Roy Earl: *See—*
Shackleton, Michael Allen; and Anderson, Roy Earl, 3,936,902.

Anderson, Terry G.: *See—*
Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., 3,937,572.

Anderson, Warren A.; Rosenberg, Lawrence; and Damon, Melvin H., Jr., to United States of America, Navy. Electronic bearing selector for omni-directional signals. 3,936,954, Cl. 35-10.400.

Andrews, Daniel Marshall: *See—*
Brummett, Charles Roscoe; Shaak, Ray Ned; and Andrews, Daniel Marshall, 3,937,857.

Andringa, Keimpe, to Raytheon Company. Laser gyroscope. 3,937,578, Cl. 356-106.0LR.

Angelo Guala S.p.A.: *See—*
Guala, Piergiacomo, 3,937,348.

Angelopoulos, Peter G.: *See—*
Pederson, Carl N.; and Angelopoulos, Peter G., 3,938,144.

Anglo-American Clays Corporation: *See—*
Nott, Alan J., 3,937,632.

Anumin Pty. Limited: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,937,657.

Aoki, Hiroshi: *See—*
Shimotsuma, Sakae; Asai, Takeo; Hosoi, Masahiro; Aoki, Hiroshi; and Masuda, Masanori, 3,937,754.

Applied Inventions Corporation: *See—*
Kehler, Paul, 3,937,288.

Arai, Hiroshi; and Taga, Yutaka, to Toyoto Jidosha Kogyo Kabushiki Kaisha. Automatic transmission system for use with automobiles. 3,937,105, Cl. 74-846.000.

Arcata Microfilm Corporation: *See—*
Griswold, Augustus W.; and Haritonoff, Boris W., 3,936,964.

Arimura, Ichiro; Taniguchi, Hiroshi; and Tanaka, Hiromichi, to Matsushita Electric Industrial Co., Ltd. Color television signal recording employs chrominance below luminance spectrum and color burst to correct timing variations. 3,938,180, Cl. 358-8.000.

Armco Steel Corporation: *See—*
Hortvet, Douglas R.; and Bennett, Norman C., 3,937,054.

Arthur D. Little, Inc.: *See—*
von Thuna, Peter C., 3,937,086.

Artz, Kenneth W., to Koszegi Leather & Vinyl Products, Inc. Article carrier with improved combination belt loop and clip. 3,937,373, Cl. 224-26.00R.

Asada, Tsunesaburo; Horiuchi, Takefumi; Matsumoto, Kiyoshi; Monju, Yoshiyuki; Yamaguchi, Yoshihiro; Noguti, Masataka; Nishihara, Masao; Fujita, Tatsu; and Matsushita, Tomiharu, to Kobe Steel Ltd. Method of manufacturing compound billets for hydrostatic extrusion. 3,937,385, Cl. 228-131.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Nakajima, Hitoshi; Nomura, Fujio; and Izawa, Shinichi, 3,937,669.

Asai, Takeo: *See—*
Shimotsuma, Sakae; Asai, Takeo; Hosoi, Masahiro; Aoki, Hiroshi; and Masuda, Masanori, 3,937,754.

Asako, Tsunehiko; Soma, Takenobu; Masuya, Hirotomo; Harukawa, Tadatsugu; and Miki, Takuichi, to Takeda Chemical Industries, Ltd. 6-(1'-Cyclohexenylglycinamido)penicillanic acid and salts thereof. 3,937,699, Cl. 260-239.100.

Asano, Seizi, to Fuji Photo Optical Co., Ltd. Photographic camera with automatic exposure control means. 3,938,165, Cl. 354-50.000.

Ascoli, Fred; and Hermann, Robert R., to Standard Container Company. Heat sealing apparatus. 3,937,645, Cl. 156-522.000.

Ashland Oil, Inc.: *See—*
Throckmorton, Peter E.; Frey, Sari; and Grote, Dace, 3,937,727.

Aspinwall, Robert H., to General Motors Corporation. By-pass jet engine with centrifugal flow compressor. 3,937,013, Cl. 60-226.00R.

Assanovich, Konstantin Sergeevich: *See—*
Semkina, Novella Vladimirovna; Evdokimova, Zinaida Ulyanovna; Assanovich, Konstantin Sergeevich; and Rozlovsky, Anatoly Alexandrovich, 3,937,670.

Atalla, Martin M.; and Liu, Alexander F., to Atalla Technovations Company. Personal verification system. 3,938,091, Cl. 340-149.00A.

Atalla Technovations Company: *See—*
Atalla, Martin M.; and Liu, Alexander F., 3,938,091.

Atlantic Richfield Company: *See—*
Thornton, Bruce C.; Albert, Michael B.; and Worrell, G. Richard, 3,937,747.
Yoo, Jin Sun, 3,937,742.

Audi NSU Auto Union Aktiengesellschaft: *See—*
Bihler, Wolfgang, 3,937,197.
Stock, Dieter; and Steinwart, Johannes, 3,937,186.

Augstkalns, Valdis Ansis, to c/o E. I. Du Pont de Nemours & Co. Process of preparing high molecular weight polyamide with recovery of diamine and return of same to polymerization system. 3,937,686, Cl. 260-78.00R.

Aupor, Hans: *See—*
Beschorner, Franz; Feurer, Burkart; and Aupor, Hans, 3,937,017.

Austin Aeromarine, Inc.: *See—*
Austin, Thomas M., 3,937,164.

Austin, Thomas M., to Austin Aeromarine, Inc. High speed water craft apparatus. 3,937,164, Cl. 114-66.50R.

Automobiles Peugeot: *See—*
Pommellet, Olivier; and Drioton, Guy, 3,937,076.

Avery, Bennett W., to Caterpillar Tractor Co. Replaceable lubricating cartridge for spline connections. 3,937,300, Cl. 184-70.000.

Avins, Jack, to RCA Corporation. Automatic luminance channel frequency response control apparatus. 3,938,181, Cl. 358-38.000.

Ayers, David T., Jr.; Doerfler, Roger E.; and Stelzer, William, to Kelsey-Hayes Company. Proportioning brake control device with bypass. 3,937,523, Cl. 303-6.00C.

Azumano, Hideyuki, to Sansyu Sangyo Co., Ltd. Tobacco leaf curing system. 3,937,227, Cl. 131-134.000.

Babcock, John C.; and Holysz, Roman P., to Upjohn Company, The. Therapeutic composition and method of treating advanced or disseminated mammary cancer. 3,937,827, Cl. 424-243.000.

Babcock & Wilcox Company, The: *See—*
Durrant, Oliver W.; and Smith, John William, 3,937,024.

Backstrom, Inga L.; Hartler, Nils J. C.; and Kringstad, Knut P., to Svenska Traforskningsinstitutet. Method of increasing cellulosic pulp yields in an alkaline digestion process. 3,937,647, Cl. 162-16.000.

Bacquie, Serge B.; and Cheylus, Jean-Francois M., to Poclain. Pressurized fluid feed apparatus. 3,937,597, Cl. 417-216.000.

Badertscher, Gerhard: *See—*
Gundacker, Siegbert; and Badertscher, Gerhard, 3,937,920.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Staiger, Gerhard; Bronstert, Klaus; Schick, Hannes; Hennenberger, Peter; and Mueller-Tamm, Heinz, 3,937,691.
Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; Fauth, Karl-Heinz; and Gehrig, Heinz, 3,937,772.

Baird, Charles; and Plum, William B. Resonance earth structure logging. 3,938,072, Cl. 340-15.50R.

Bajars, Laimonis: *See—*
Croce, Louis J.; and Bajars, Laimonis, 3,937,746.

Baker, Charles E., Jr.: *See—*
Peckham, Vernon D.; Baker, Charles E., Jr.; and Bryce, Donald H., 3,937,574.
Baker, James P.; and Silagy, Richard J., to Weatherhead Company, The. Hydraulic brake booster with shut-off means. 3,937,127, Cl. 91-372.000.
Baker, Virgil D., III: *See—*
Becker, Bernard E.; Baker, Virgil D., III; and Britton, Theodore S., 3,938,106.
Balas, Jaroslav G.: *See—*
Baumgartner, Herman J.; and Balas, Jaroslav G., 3,937,759.
Balcombe, Bobby L., to Phillips Fibers Corporation. High relief double knit fabric. 3,937,041, Cl. 66-197.000.
Balda-Werke: *See—*
Lange, Karl-Heinz, 3,938,168.
Ball Brothers Research Corporation: *See—*
Sanford, Gary G., 3,938,161.
Ball, Peter William: *See—*
Scott, Kenneth Thomas Bartlett; Grimes, John Herbert; and Ball, Peter William, 3,937,667.
Balmforth, Trevor, to Stalwart Dyeing Company Limited. Apparatus for dyeing pile fabrics. 3,937,044, Cl. 68-205.00R.
Baltimore Brushes, Inc.: *See—*
O'Connell, Gerard, 3,938,120.
Bammert, Karl, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Multi-stage axial flow compressor. 3,937,592, Cl. 415-194.000.
Bank, Morton L.; and Spieler, Ronald J. Wire dolly. 3,937,414, Cl. 242-86.50R.
Banko, Anton, to Surgical Design Corporation. Surgical instrument employing cutter means. 3,937,222, Cl. 128-305.000.
Banks, James W., to Chemetron Corporation. Bellows forming method and apparatus. 3,937,051, Cl. 72-110.000.
Bankston, Benjamin F.: *See—*
Clotfelter, Wayman N.; and Bankston, Benjamin F., 3,938,037.
Barber-Colman Company: *See—*
Ahlgren, Joseph R., 3,937,932.
Hubbartt, Donald S., 3,936,931.
Barber, Theodore C. Artificial nest for hatching bees. 3,936,894, Cl. 6-11.000.
Barlocher, Toni; and Ebert, Edith, to Ciba-Geigy Corporation. Agents for regulating plant metabolism. 3,937,626, Cl. 71-92.000.
Barlow, George J., to Honeywell Information Systems, Inc. Error detection apparatus for verifying binary coded constants. 3,938,084, Cl. 340-146.1AB.
Barnert, Heiko, to Kernforschungsanlage Julich Gesellschaft. Safety equipment for installations under pressure. 3,937,255, Cl. 138-148.000.
Barnes, Thomas P.: *See—*
Hickey, Richard C.; Swafford, Jerry W.; Swartzendruber, Robert F.; and Barnes, Thomas P., 3,937,453.
Barnett, Charles J., to Eli Lilly and Company. Exchange amination process for preparing 2-hydrazinobenzothiazoles. 3,937,714, Cl. 260-305.000.
Barras, Gerard, to Agence Nationale de Valorisation de la Recherche (ANVAR). Window having a bellows-type opening movement and permitting complete reversal of the window-leaf. 3,936,978, Cl. 49-252.000.
Barrett, Dene. Cathode-ray tube signal generator having resistance configurated electron receptor. 3,937,997, Cl. 313-418.000.
Barrow, Gilbert C.: *See—*
Massa, Frank; and Barrow, Gilbert C., 3,937,991.
Barthlome, Donald E., to United States of America, General Counsel-Code GP. Therapeutic hand exerciser. 3,937,215, Cl. 128-26.000.
Bartik, Ivan, to Keene Corporation. Marine discharge control apparatus and method for treating fluids on a marine vessel. 3,937,662, Cl. 210-23.000.
Bartos, Josef A.: *See—*
Ahlstone, Arthur G.; and Bartos, Josef A., 3,937,251.
Barz, Alfred: *See—*
Schillalies, Helmut; and Barz, Alfred, 3,937,957.
BASF Aktiengesellschaft: *See—*
Seydl, Wolfgang; and Strickle, Erich, 3,937,757.
Bashark, Larry Thomas, to Whirlpool Corporation. Vacuum cleaner clogged condition indicator. 3,936,904, Cl. 15-339.000.
Bateman, George H., to Martin Marietta Corporation. Electro-optical ranging means. 3,937,575, Cl. 356-5.000.
Bathory, Judit; Ery nee Nagy, Marta; Gerei, Lajos; Lakatos, Ferenc; Stiller nee Kisteleki, Magdolna; and Vaghy, Tamas, to Phylaxia Oltoanyag- es Tapszertermelo Vallalat. Process for the recovery of zinc bacitracin free from zinc hydroxide. 3,937,694, Cl. 260-112.50R.
Battail, Gerard, to Thomson-CSF. Transmitting station and receiving station for operating with a systematic recurrent code. 3,938,085, Cl. 340-146.1AQ.
Batzer, Hans: *See—*
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,937,751.
Bauer, Benjamin B., to CBS Inc. Compatible four channel radio broadcast and receiving system. 3,937,896, Cl. 179-15.0BT.
Bauer, Everhard. Machine for filling carrying trays with objects disposed in groups. 3,936,992, Cl. 53-162.000.
Bauer, Fritz. Sliding piston gas spring. 3,937,450, Cl. 267-113.000.
Baughman, Harold E. Grab-stick for litter. 3,937,512, Cl. 294-19.00R.
Baumann, Hans D. Rotary valve. 3,937,441, Cl. 251-298.000.
Baumgartner, Herman J.; and Balas, Jaroslav G., to Shell Oil Company. Hydrogenation process. 3,937,759, Cl. 260-879.000.
Baxter Laboratories, Inc.: *See—*
Witty, Michael E., 3,937,370.
Wolf, Ludwig, Jr.; and Dominguez, David G., 3,937,064.
Bayer AG: *See—*
Heine, Hans-Georg; Rudolph, Hans; and Fuhr, Karl, 3,937,722.
Bayer Aktiengesellschaft: *See—*
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Frommer, Werner; Puls, Walter; and Schmidt, Delf, 3,937,817.
BBC Brown Boveri & Company Limited: *See—*
Boniger, Jacques; and Narayan, Venkat, 3,938,007.
Beale, William Taylor, to Research Corporation. Power piston actuated displacer piston driving means for free-piston stirling cycle type engine. 3,937,018, Cl. 60-520.000.
Bean, Kenneth E.; and Lloyd, William W., to Texas Instruments Incorporated. Fet and bipolar device and circuit process with maximum junction control. 3,936,929, Cl. 29-580.000.
Bear, James E.: *See—*
Weber, Charles W.; Rucker, C. Olen; Peavy, Patrick L.; Woo, Pak-Fat William; and Bear, James E., 3,937,973.
Beck, Harold D., to International Harvester Company. Fan shroud exit structure. 3,937,189, Cl. 123-41.490.
Beck, Werner: *See—*
Zeh, Willi; Beck, Werner; and Munding, German, 3,937,012.
Becker, Arno, to Bruckner-Trockentechnik KG. Cloth feeding device for tentering machines. 3,936,915, Cl. 26-57.00A.
Becker, Bernard E.; Baker, Virgil D., III; and Britton, Theodore S. Production data gathering and processing system. 3,938,106, Cl. 340-172.500.
Becker, Danny J.; Boggs, Roger L.; Vaughn, Kenneth E.; and Shuler, James Richard, to Caterpillar Tractor Co. Low ground pressure track shoe. 3,937,529, Cl. 305-54.000.
Becker, Raymond. Key for removing locking members from drive chains or the like. 3,937,005, Cl. 59-7.000.
Becker, Rudolf; and Brautigam, Max, to Linde Aktiengesellschaft. System for the transportation of low-temperature fluids. 3,937,353, Cl. 220-9.0LG.
Beckman Instruments G.m.b.H.: *See—*
Schmider, Paul, 3,937,576.
Beckman Instruments, Inc.: *See—*
Schott, Dan J., 3,937,999.
Beckwith, Sterling; Vogel, Robert E.; and Goyman, William, to Kysor Industrial Corporation. Air defrost display case. 3,937,033, Cl. 62-155.000.
Becton, Dickinson & Company: *See—*
Gutcho, Sidney; Rapun, Raul; Rutner, Herman; and Charig, Andrew, 3,937,698.
Bedue, Jean Robert: *See—*
Caruel, Jacques Emile Jules; Bedue, Jean Robert; and Cantaloube, Bernard Andre, 3,937,011.
Beebe, Ronald. SCR motor voltage controller. 3,938,015, Cl. 318-139.000.
Beich, Wolfgang: *See—*
Ulbrich, Hermann; and Beich, Wolfgang, 3,937,733.
Belew, Robert R.; and Davis, Donald E., to United States of America, General Counsel-Code GP. Optical pantograph. 3,936,942, Cl. 33-24.00R.
Bell & Howell Company: *See—*
Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., 3,937,572.
Bell Telephone Laboratories, Incorporated: *See—*
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Clarke, Patrick William, 3,938,024.
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Denenberg, Jeffrey Neil, 3,937,899.
Funk, Charles John; and Minchenko, George, 3,937,908.
Judice, Charles Norris, 3,937,878.
Myers, Oscar, 3,937.888.
Ngo, Peter Dinh-Tuan; and Ninke, William Herbert, 3,938,137.
O'Bryan, Henry Miles, Jr.; Pluorde, James Kevin; and Thomson, John, Jr., 3,938,064.
Plewes, John Travis, 3,937,638.
Van Vechten, James Alden, 3,937,209.
Bell, William W., III; and Shizume, Peter K., to Sperry Rand Corporation. Data communication apparatus for use in a telephone system. 3,937,889, Cl. 179-2.0DP.
Bellanca, Nicolo; and Furia, Thomas Edward, to Dynapol. Zoned coloration. 3,937,851, Cl. 426-540.000.
Beloit Corporation: *See—*
Chance, James L.; and Han, Shu Tang, 3,936,953.
Justus, Edgar J., 3,937,410.
Benassi, Dominic A., to Minnesota Mining and Manufacturing Company. Antipilferage system and marker therefor. 3,938,125, Cl. 340-280.000.
Bende, Miklos. Sausage brushing apparatus. 3,936,900, Cl. 15-3.120.
Bendix Corporation, The: *See—*
Grabb, Frederick G.; Owens, Carl D.; and Gardner, Delbert J., 3,937,126.
Presley, Rex Wallace; and Lorraine, Jack Richardson, 3,937,994.
Reddy, Junuthula Nirdosh, 3,938,075.
Sisco, William C.; and Grabb, Frederick G., 3,937,021.
Benfur Engineering Company: *See—*
Fuerst, Bernard, 3,936,979.
Bennett, Norman C.: *See—*
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Benning, Vernon A., to M. L. Aviation Company Limited. Apparatus for maneuvring aircraft. 3,937,290, Cl. 180-14.00C.

Benson, Richard W.; Crnak, John R.; and Ingraham, Richard G., to Albany International Corporation. Billiard ball. 3,937,467, Cl. 273-59.00R.

Benvenutti, Ronald A., to Meloy Laboratories, Inc. Liquid scintillation systems and apparatus for measuring high-energy radiation emitted by samples in standard laboratory test tubes. 3,937,961, Cl. 250-328.000.

Beretta, Germano: *See—*
Ferrentino, Antonio; and Beretta, Germano, 3,937,559.

Bergen, Henry. Toroidal cylinder orbiting piston engine. 3,937,187, Cl. 123-8.470.

Berger, Roger; Estienne, Claude; and Lapie, Jean, to Commissariat a l'Energie Atomique. Generator for controlling an ultrasonic transducer. 3,938,071, Cl. 340-15.000.

Bergeron, Claude A.; and Smith, Hubert L., to Philip Morris Incorporated. Apparatus for applying a backing of plastic material to a cutting blade. 3,937,644, Cl. 156-498.000.

Berk, Martin Adolph: *See—*
Lange, Henry James; McCunn, Myron Lee; Berk, Martin Adolph; Classen, Peter Jay; and Allen, David Thomas, 3,938,016.

Berney, Jean-Claude. Watch movement driven by a spring and regulated by an electronic circuit. 3,937,001, Cl. 58-23.00D.

Bernstein, Philip; and Stirpe, John P., to ESB Incorporated. Perfluoro compound-soil resistant epoxy resin compositions. 3,937,750, Cl. 260-830.0TW.

Bertail, Philippe. Trailer having a self-lifting platform. 3,937,301, Cl. 187-19.000.

Bertin, Ira L.: *See—*
Bertin, Mannie; and Bertin, Ira L., 3,937,133.

Bertin, Mannie; and Bertin, Ira L. Outlets for conditioned air and mounting frames therefor. 3,937,133, Cl. 98-40.00D.

Bertotti, Robert V.: *See—*
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Beschorner, Franz; Feurer, Burkart; and Aupor, Hans, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft; and Motoren-Werke Mannheim Aktiengesellschaft, Vormals Benz Abtielung Stationarer Motorenbau, Firma. External combustion hot gas engine system. 3,937,017, Cl. 60-516.000.

Bessiere, Pierre Etienne, to Precision Mecanique Labinal. Structure of filter members. 3,937,663, Cl. 210-493.00R.

Beutner, Richard; and Ploger, Friedrich, to RBG, Reaktorbrennelemente GmbH. Method for removing fluoride ions from UO_2 powders. 3,937,784, Cl. 423-19.000.

Bhan, Andrew Tej, to Universal Oil Products Company. Recuperative thermal recombining system for handling loss of coolant. 3,937,796, Cl. 423-580.000.

Bible, Harley V.; and Moon, William T., Jr., to Robertshaw Controls Company. Condition responsive valve construction. 3,937,244, Cl. 137-269.000.

Bier, Kenneth C.; Johnson, Kalin S.; and Herman, Ronald E., to Colt Industries Operating Corporation. Variable venturi carburetor. 3,937,768, Cl. 261-44.00R.

Bierlein, Carl A.; and Schaefer, Ernest D., to General Motors Corporation. Master cylinder. 3,937,020, Cl. 60-534.000.

Bihler, Wolfgang, to Audi NSU Auto Union Aktiengesellschaft. Heating means for the intake system of a water-cooled combustion engine. 3,937,197, Cl. 123-122.00H.

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Bingham, John A. C., to Vadic Corporation. Full-duplex communication system on a two wire line. 3,937,882, Cl. 178-69.50R.

Bio-Medical Sciences, Inc.: *See—*
Sagi, Zsigmond L.; Lang, Robert A.; Scott, Jimmie D.; Weinstein, Berel; and Pickett, Charles G., 3,937,323.

Bio-Rad Laboratories: *See—*
Lewin, Nathan; Fries, James E.; and Richards, C. Steven, 3,937,799.

Birch, James D.; Mohr, Max C.; and Monaghan, Stephen R., to Raytheon Company. Antenna element for circular or linear polarization. 3,938,158, Cl. 343-756.000.

Bird Machine Company, Inc.: *See—*
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Birkin, Michael S., to British Railways Board. Train control. 3,937,432, Cl. 246-187.00B.

Biro Fils: *See—*
Biro, Guy Dion, 3,937,257.

Biro, Guy Dion, to Biro Fils. Method and apparatus for pressurizing reservoirs of fire-fighting equipment. 3,937,257, Cl. 141-3.000.

Biron, Normand R. System of verified communication. 3,937,492, Cl. 282-25.000.

Biron, Raymond Joseph: *See—*
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Bittle, James Long; and Rubic, Wayne J., to Pitman-Moore, Inc. Feline calicivirus vaccine and production thereof. 3,937,812, Cl. 424-89.000.

Black and Decker Manufacturing Company, The: *See—*
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Black Hole Nebula Incorporated: *See—*
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Blackmond, Ronald C., to Robicon Corporation. Adjustable voltage power supply. 3,938,031, Cl. 323-23.000.

Blackstone, Michael; Maddox, Bryant K.; Rowland, Bobby A.; and Tate, Stanley L., to Southwire Company. Method and apparatus for recovering insulation and conductor from scrap insulated wire. 3,936,922, Cl. 29-234.000.

Blakeley, Ronald Edward: *See—*
Jeyes, John Anthony; and Blakeley, Ronald Edward, 3,937,593.

Blasi, Alvi R., to Raymond Lee Organization, Inc., The, a part interest. Golf swing training device. 3,937,473, Cl. 273-183.00B.

Blauer, Roland E.; and Durborow, Clarence J., to Dow Chemical Company, The; and Minerals Management, Inc. Formation fracturing with stable foam. 3,937,283, Cl. 166-307.000.

Blethen, William M.; and Milligan, Lee J. Remote monitoring communication system and terminal for utility meters. 3,937,890, Cl. 179-2.00A.

Bleyl, Donald Louis; and Irons, John Dowe, to Brown & Root, Inc. Pipe handling device. 3,937,334, Cl. 214-2.500.

Bloch, Alan; Falconer, Charles B.; Joslow, David L.; and Straube, Harold M., to Chestel, Inc. Electronic time-division-multiplexed PABX telephone system. 3,937,892, Cl. 179-15.0AL.

Blount, David H. Process for the production of monosilandiol. 3,937,782, Cl. 423-325.000.

Blum, Hans. Apparatus for comminuting tree stumps. 3,937,261, Cl. 144-218.000.

Bocker, Richard P.: *See—*
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Bode, Charles H., Jr., to United States Steel Corporation. Sliding gate mechanism with side wall mounted biasing springs. 3,937,372, Cl. 222-504.000.

Boehringer Ingelheim GmbH: *See—*
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Boisseau, Bernard. System for thermal exchangers. 3,937,275, Cl. 165-85.000.

Boldt, Jurgen; and Heine, Kurt, to Bayer Aktiengesellschaft. Polychloroprene mixture. 3,937,659, Cl. 204-159.200.

Bolles, Theodore F.; and Fleming, Peter B., to Bolles, Theodore F.; and Fleming, Peter B. Optically-transparent radiation-shielding composition. 3,937,970, Cl. 250-515.000.

Bolsinger, Alois: *See—*
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Bon, Gerard, to La Soie. Spool for fishline. 3,937,419, Cl. 242-118.400.

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Boniger, Jacques; and Narayan, Venkat, to BBC Brown Boveri & Company Limited. Electrical network protection device with automatic switch over between protection criteria. 3,938,007, Cl. 317-27.00R.

Boone, Ralph D.; and Griffin, Charles, to Lockwood Corporation. Univalve irrigation system. 3,937,237, Cl. 137-1.000.

Boothroyd, William A., to International Business Machines Corporation. Modular transaction terminal with microprocessor control. 3,937,925, Cl. 235-61.70B.

Borenstein, David E.; and Hatcher, Charles S., to Phillips Petroleum Company. Method and apparatus for the production of textured yarn. 3,936,916, Cl. 28-1.600.

Borg-Warner Corporation: *See—*
Fox, Clarence D., 3,938,074.
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Huffman, Dale F.; and Zeh, Charles E., 3,937,100.
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Borison, Victor Scott; Mattes, Hans George; McDowell, Colonel Blake, III; Schramm, George William; Soloway, Gerald Steven; and Wesner, John William, Jr., to Bell Telephone Laboratories, Incorporated. Terminal apparatus. 3,938,090, Cl. 340-149.00A.

Borkovitz, Henry S.; and Lucarz, William E., to Sola Basic Industries, Inc. Ferroresonant transformer regulator. 3,938,033, Cl. 323-60.000.

Borlai, Oszkar: *See—*
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Bourggraff, Robert: *See—*
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Bourke, Robert F., to Gould, Inc. Charger circuit for accessory battery. 3,938,020, Cl. 320-21.000.
Bowden, Nancy. Culinary coring device. 3,936,934, Cl. 30-113.200.
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Brennan, Gerald R. Multiple-board chess game with additional chessmen. 3,937,471, Cl. 273-131.0AC.
Brenner, Wolf; Lindlar, Herbert; and Hinderling, Rudolf, to Hoffmann-La Roche Inc. Process for the manufacture of 2,3,6-trimethylphenol. 3,937,740, Cl. 260-621.00R.
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Briar, Herman P., to Aerojet-General Corporation. Method and sensors for predetermining dynamic moduli in situ of castable-type material. 3,937,070, Cl. 73-88.00R.
Brickey, Orville G., to United States of America, Navy. Rotatable radar antenna feed and receiver horn. 3,938,157, Cl. 343-756.000.
Bricknell, Russell C.: *See—*
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Brix, Hermann, to Girling Limited. Disc brake calipers. 3,937,304, Cl. 188-73.500.
Broecker, Bernhard; Schardt, Richard; and Werner, Gerhard, to Hoechst Aktiengesellschaft. Process for the manufacture of heat-curable synthetic resins which can be diluted with water and are suitable for the electrophoretic coating process. 3,937,677, Cl. 260-23.70A.
Bromley, Keith; Monahan, Michael A.; and Bocker, Richard P., to United States of America, Navy. Multi-channel optical correlation system. 3,937,942, Cl. 235-181.000.
Bronstert, Klaus: *See—*
Staiger, Gerhard; Bronstert, Klaus; Schick, Hannes; Hennenberger, Peter; and Mueller-Tamm, Heinz, 3,937,691.
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Brookes, Derek John: *See—*
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Brummett, Charles Roscoe; Shaak, Ray Ned; and Andrews, Daniel Marshall, to AMP Incorporated. Catalyst for electroless deposition of metals. 3,937,857, Cl. 427-98.000.
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Bruzzese, Tiberio; and Ferrari, Rodolfo, to SPA—Societa Prodotti Antibiotici S.p.A. Lysozyme derivatives. 3,937,815, Cl. 424-94.000.
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Buck, Immanuel. Blade arrangement for a meat cutter. 3,937,408, Cl. 241-282.200.
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Bumpstead, John; and Costa, Robert B., to Clemar Manufacturing Corporation. Device for insulating an electrical wire joint. 3,937,870, Cl. 174-87.000.
Burgess, Ronald R., to Tom McGuane Industries, Inc. Pressure-vacuum relief fuel filler cap. 3,937,357, Cl. 220-203.000.
Burkett, Richard O., to Westinghouse Air Brake Company. Apparatus for checking integrity of magnet valves in electro-pneumatic brake systems. 3,937,074, Cl. 73-121.000.
Burnham, Gerald O.; and Weber, John W., to Hughes Aircraft Company. Direction coded digital stroke generator providing a plurality of symbols. 3,938,130, Cl. 340-324.00A.
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Busch, Walter; Hammer, Klaus-Dieter; and Klendauer, Wolfgang, to Hoechst Aktiengesellschaft. Process for the manufacture of consolidated shaped structures of cellulose hydrate. 3,937,672, Cl. 260-17.300.
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Byne, Zachary Paul. Linear cut sewing tape. 3,936,944, Cl. 33-137.00R.
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Callahan, Bernard E., to Vapor Corporation. System for telecommunicating vehicle operation data between a ground station and a remote data processing station. 3,938,092, Cl. 340-150.000.
Calvin, Edward L. Interlocking brick or building block and walls constructed therefrom. 3,936,987, Cl. 52-309.000.
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Campbell, Glenn M.; and Liedman, Stanley G., to General Mills, Inc. Chip fracturing from a fried ribbon. 3,937,848, Cl. 426-439.000.
Campbell, Stephen K., to Coulter Electronics, Inc. Method and apparatus for providing primary coincidence correction during particle analysis. 3,938,038, Cl. 324-71.0CP.
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Candor, James T. Method for playing strategy golf. 3,937,466, Cl. 273-32.00R.

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Cap, Daniel M., to General Electric Company. Metal halide lamp using loop electrodes. 3,937,996, Cl. 313-217.000.

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Carra, Mark Ernest; and Manrique, Louis Albert, Jr., to Johnson & Johnson. Interlining made of a thermoplastic and thermosetting resin composition. 3,937,859, Cl. 428-194.000.

Carroll, James C., to Phillips Petroleum Company. Nesting and stacking containers. 3,937,327, Cl. 206-507.000.

Carter, Clarence F., to Carter Engineering Company. Apparatus for severing thin tubing members. 3,936,909, Cl. 17-42.000.

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Caruel, Jacques Emile Jules; Bedue, Jean Robert; and Cantaloube, Bernard Andre, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Fuel injector for atomizing and vaporizing fuel. 3,937,011, Cl. 60-39.710.

Caruso, Vincent P.; and Minter, Elbert J., to United States of America, National Aeronautics and Space Administration. Method of peening and portable peening gun. 3,937,055, Cl. 72-399.000.

Castagna, Eugene G., to Dart Industries Inc. Process for the production of high impact compositions of polyethylene and polypropylene block copolymers. 3,937,758, Cl. 260-876.00B.

Castoldi, Luigi. Water jet propelling apparatus for boats. 3,937,172, Cl. 115-12.00R.

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Caudel, Edward R., to Texas Instruments Incorporated. Computing system bus. 3,938,094, Cl. 340-172.500.

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Centre Technique des Industries Mechaniques: *See—*
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Chan, Kingsley, to Chan, Kingsley. Tennis scoring device. 3,936,963, Cl. 40-70.00R.

Chance, James L.; and Han, Shu Tang, to Beloit Corporation. Air impingement system. 3,936,953, Cl. 34-160.000.

Chance, Leon H.; and Moreau, Jerry P., to United States of America, Agriculture. Organo-phosphorus compounds containing perfluoroalkyl radicals and their application to cellulosic textiles. 3,937,724, Cl. 260-502.40P.

Chao, Albert L.; and Chao, Ethel. Lighted jewelry box. 3,937,320, Cl. 206-75.000.

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Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, to Kumiai Chemical Industry Co., Ltd. Compositions and methods of combatting bacteria and fungi using 2-methylbenzanilide derivatives. 3,937,840, Cl. 424-324.000.

Chodzko, Richard A., to United States of America, Air Force. Calorimeter for an unstable laser resonator. 3,937,079, Cl. 73-190.0EW.

Christie, Joe William. Method and apparatus for connecting a right angle service line to a main. 3,937,245, Cl. 137-318.000.

Chrysler Corporation: *See—*
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Chu, David C.: *See—*
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Ciba-Geigy Corporation: *See—*
Barlocher, Toni; and Ebert, Edith, 3,937,626.
Cook, Barry, 3,937,711.
Hunger, Alfred; and Janssen, Hans-Jochen, 3,937,834.
Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, 3,937,751.
Vogel, Christian; and Aebi, Rudolf, 3,937,730.

Ciccarone, Angelo: *See—*
Garcea, Giampaolo; Police, Gennaro; and Ciccarone, Angelo, 3,937,766.

Cicognani, Mario, to Industrie Pirelli S.p.A. Toothed belt. 3,937,094, Cl. 74-231.00C.

Cimarusti, Christopher M.: *See—*
Varma, Ravi K.; and Cimarusti, Christopher M., 3,937,720.

Cincinnati Butchers' Supply Company, The: *See—*
Cook, Frank M., 3,936,908.

Cinex Communications Inc.: *See—*
Kopernicky, Jaroslav J., 3,937,378.

Citizen Watch Co., Ltd.: *See—*
Murakami, Tomomi; and Kawashima, Hideyuki, 3,937,049.
Natori, Minoru; Nomura, Yasushi; Sekiya, Fukuo; Morokawa, Shigeru; and Nakai, Akira, 3,937,004.

Clack, Peter J.; and Moreland, George R., to Leeds & Northrup Company. Auto-ranging glucose measuring system. 3,937,615, Cl. 23-253.00R.

Clapsaddle, Arthur B., to United States of America, Navy. Sonar reverberation simulation. 3,936,958, Cl. 35-10.400.

Clar, Milton. Apparatus for the compaction of refuse material and the like. 3,937,354, Cl. 220-63.00R.

Clark, Benton C., III: *See—*
Stafford, R. Wayne; Tobey, William H.; and Clark, Benton C., III, 3,937,953.

Clark Equipment Company: *See—*
Haddock, Louis A., 3,937,294.

Clark, Harold E., to Xerox Corporation. Character coding and recognition system. 3,938,088, Cl. 340-146.30B.

Clark, Robert Kingsbury, Jr., to Abbott Laboratories. Insecticidal compositions comprising mixtures of *bacillus thuringiensis* and chlordimeform. 3,937,813, Cl. 424-93.000.

Clarke, Patrick William, to Bell Telephone Laboratories, Incorporated. Converter regulation by controlled conduction overlap. 3,938,024, Cl. 321-2.000.

Classen, Peter Jay: *See—*
Lange, Henry James; McCunn, Myron Lee; Berk, Martin Adolph; Classen, Peter Jay; and Allen, David Thomas, 3,938,016.

Clegg, Samuel E. Method and apparatus for rooted plant excavating and plant package produced thereby. 3,936,960, Cl. 37-2.00R.

Clemar Manufacturing Corporation: *See—*
Bumpstead, John; and Costa, Robert B., 3,937,870.

Clemens, Donald E.; Piepho, Donald A.; and Reiss, Stephen W., to Caterpillar Tractor Co. Segmented and cushioned idler for track-type vehicles and method for repairing same. 3,937,528, Cl. 305-21.000.

Clerx, Henricus P. M.; Extra, Pieter M. J.; Keursten, Leonardus L. M.; and Peeters, Franciscus M. J., to Oce-van der Grinten N.V. Fixing device. 3,937,919, Cl. 219-216.000.

Clewes, Antony Brasher; and Tuckwood, Denis William, to TRW Inc. Multiway connector for a printed circuit board. 3,937,546, Cl. 339-61.00R.

Clotfelter, Wayman N.; and Bankston, Benjamin F., to United States of America, National Aeronautics and Space Administration. Device for measuring the ferrite content in an austenitic stainless steel weld material. 3,938,037, Cl. 324-34.00R.

Clougherty, Edward V., to Manlabs, Incorporated. Ternary boride product and process. 3,937,619, Cl. 29-182.500.

Cloup, Philippe. Device for injecting an adjuvant into a liquid. 3,937,241, Cl. 137-99.000.

Clymer, Bonita E., special administratrix: *See—*
Clymer, Joseph D., deceased, 3,937,095.

Clymer, Joseph D., deceased (by Clymer, Bonita E., special administratrix), to Lincoln Manufacturing Company, Inc. Self adjusting elevator. 3,937,095, Cl. 74-224.000.

Coal Industry (Patents) Limited: *See—*
Monks, Harry, 3,937,151.

Coats Company, Inc., The: *See—*
Mikovits, John L.; Strang, Elmer J.; Scott, Ray A.; and Sorenson, Billy L., 3,937,264.

Cobbledick-Kibbe Glass Company: *See—*
Hammerel, James T., 3,937,329.

Cockram, Geoffrey Norman: *See—*
Towersey, Peter John; Longton, John; and Cockram, Geoffrey Norman, 3,937,693.

Cognacq, Jean-Claude, to Societe anonyme dite: Hexachimie. Esters of 2,2-diphenyl-cyclopropane-carboxylic acids as cough suppressants. 3,937,832, Cl. 424-267.000.

Cognigni, Franco; and Cesca, Silvano, to Snam Progetti S.p.A. Continuous bi-compound acrylic bulky yarn and the method of the production of same. 3,937,000, Cl. 57-157.0TS.

Cohen, Jules Barry, to Medical Laboratory Automation, Inc. Package for disposable pipette tips. 3,937,322, Cl. 206-216.000.

Cohen, Marvin: *See—*
Strandtmann, Maximilian von; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,937,704.

Cohen, Samuel W. Games using magnetically actuated members. 3,937,469, Cl. 273-85.00F.

Colas, Jean Louis: *See—*
Teissier, Raymond; Colas, Jean Louis; and Taisne, Dominique, 3,937,846.

Cole, William Max; and Futamura, Shingo, to Firestone Tire & Rubber Company, The. Process for producing multiblock copolymer and products produced thereby. 3,937,760, Cl. 260-880.00B.

Coleman, Howard. Torque-jet engine. 3,937,009, Cl. 60-39.350.

Colgate-Palmolive Company: *See—*
Delaney, Thomas James; and Pierson, William Grant, 3,937,321.
Delaney, Thomas James; and Pierson, William Grant, 3,937,803.
Delaney, Thomas James; and Pierson, William Grant, 3,937,804.
Harrison, Michael, 3,937,805.

Colt Industries Operating Corporation: *See—*
Bier, Kenneth C.; Johnson, Kalin S.; and Herman, Ronald E., 3,937,768.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Newman, Douglas A., 3,937,178.

Colwill, Richard H. Sheet recirculator. 3,937,454, Cl. 271-6.000.

Comisarow, Melvin Barnet; and Marshall, Alan George, to Nicolet Technology Corporation. Fourier transform ion cyclotron resonance spectroscopy method and apparatus. 3,937,955, Cl. 250-283.000.

Commissariat a l'Energie Atomique: *See—*
Berger, Roger; Estienne, Claude; and Lapie, Jean, 3,938,071.
Consoli, Terenzio, 3,937,917.
Leheu, Jacques, 3,937,653.

Communications Satellite Corporation: *See—*
Campanella, Samuel Joseph; Suyderhoud, Henri George; and Onufry, Michael, Jr., 3,937,907.

Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
Dillenschneider, Jean-Paul, 3,937,862.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Alais, Michel, 3,937,028.
Levasseur, Georges; and Garconnat, Michel, 3,938,061.
Soulas, Jacques; and Vilella, Paul, 3,937,913.

Concordia Fluidtechnik GmbH Steuergerate: *See—*
Stahle, Kurt, 3,937,254.

Conde, Francis E., Sr. Handle for a nunchaku device. 3,937,468, Cl. 273-84.000.

Conn, Charles E., Jr., to TRE Corporation. Aerodynamic shell structure with fittings and method for fabricating same. 3,936,920, Cl. 29-156.80B.

Consoli, Terenzio, to Commissariat a l'Energie Atomique. Method for producing and heating a plasma. 3,937,917, Cl. 219-121.00P.

Consolidated Engineering Company: *See—*
Reuter, Brian R., 3,937,521.

Consumat Systems, Inc.: *See—*
Hughes, Carroll T., Jr., 3,937,154.

Continental Can Company, Inc.: *See—*
Sawert, Walter, 3,937,383.

Continental Hair Products, Inc.: *See—*
Tomaro, Patrick M., 3,937,232.
Tomaro, Patrick M., 3,937,543.

Continental Oil Company: *See—*
Every, Richard L., 3,937,728.
Gorim, Everett; Kulik, Metro D.; and Struck, Robert T., 3,937,788.
Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., 3,937,787.
Sievert, John A., 3,937,520.

Control Data Corporation: *See—*
Steiner, Louis Kent, 3,938,100.

Cook, Barry, to Ciba-Geigy Corporation. 4-(Carboxamidoethyl) piperidines. 3,937,711, Cl. 260-293.860.

Cook, Frank M., to Cincinnati Butchers' Supply Company, The. Hide pulling method and apparatus. 3,936,908, Cl. 17-21.000.

Cook, Neal A., to Modine Manufacturing Company. Cooling system and method of cooling. 3,937,031, Cl. 62-98.000.

Cook, Robert R.; and Diehl, Roy E., to Ford Motor Company. Intake manifold for an internal combustion engine having an internally contained exhaust gas recirculation cooler. 3,937,196, Cl. 123-119.00A.

Cooley, William Edward, to Procter & Gamble Company, The. Oral compositions for caries prophylaxis. 3,937,806, Cl. 424-52.000.

Cooper, James Albert, Jr., to Bell Telephone Laboratories, Incorporated. Apparatus and method for regenerating charge. 3,937,985, Cl. 307-221.00D.

Copeland, William F.; Sciulli, Charles M., Jr.; and White, Donald G., to United States Steel Corporation. Liquid-fuel atomization and injection device. 3,937,449, Cl. 266-29.000.

Corbett, John McCreath; and Linke, Josef Maria, to Post Office, The. Non-linear correction of waveforms. 3,938,050, Cl. 328-163.000.

Corbin Gentry, Inc.: *See—*
Hanagan, Michael W., 3,937,291.

Cordone, Leonard G.; Donakowski, William A.; and Morgan, John R., to Ford Motor Company. Method for application of wear-resistant coating. 3,937,266, Cl. 164-9.000.

Cornwell, Lionel B. Controllable power transferring device utilizing a short-circuited controlled reactance. 3,938,030, Cl. 323-50.000.

Costa, Robert B.: *See—*
Bumpstead, John; and Costa, Robert B., 3,937,870.

Cottingham, Hugh, to Black Hole Nebula Incorporated. Apothecary safety closure. 3,937,347, Cl. 215-213.000.

Coulter Electronics, Inc.: *See—*
Campbell, Stephen K., 3,938,038.

Countryman, Donald L., to Wagner Mining Equipment, Inc. Shovel loader with ejector bucket. 3,937,345, Cl. 214-510.000.

Courtot, Louis B., to Weatherhead Company, The. Mounting for nonmetallic valves. 3,937,499, Cl. 285-319.000.

Cox, Elton D. Filter device for deep fat fryer. 3,937,136, Cl. 99-408.000.

Cox Instrument Division, Lynch Corporation: *See—*
Dabanian, Karnig H.; Rapp, Lawrence F.; and Good, Dale C., 3,937,081.

Cox, Joe L. Multi-purpose vehicle for hauling bulk material or discrete packages. 3,937,338, Cl. 214-83.360.

Coyne, Nancy, to International Paper Company. Sterile aspiration catheter. 3,937,220, Cl. 128-276.000.

Crabtree, Delbert M., to Sisson, Margaret, a part interest. Sharpening stone for dehorners. 3,936,982, Cl. 51-211.00R.

Craig, J. Andrew, to Gripnail Corporation. Apparatus for attaching insulating material to sheet metal. 3,937,380, Cl. 227-100.000.

Creamer, Adelene. Buoyant shoe. 3,936,896, Cl. 9-310.00D.

Creative Tools, Inc.: *See—*
Whiteford, Carlton L., 3,937,324.

Cremer, Joseph; and Martin, Willi, to Hoechst Aktiengesellschaft. Apparatus for the manufacture of phosphorous acid. 3,937,616, Cl. 23-263.000.

CRI-DAN: *See—*
Renoux, Pierre E., 3,937,110.

Criscimagna, Tony Nick, to International Business Machines Corporation. Gas panel with improved circuit for write operation. 3,938,107, Cl. 340-173.0PL.

Critelli, Frank, to Lawrence Peska Associates, Inc., a part interest. Retractable dog leash. 3,937,418, Cl. 242-107.40R.

Crnak, John R.: *See—*
Benson, Richard W.; Crnak, John R.; and Ingraham, Richard G., 3,937,467.

Croce, Louis J.; and Bajars, Laimonis, to Petro-Tex Chemical Corporation. Sulfur promoted oxidative dehydrogenation. 3,937,746, Cl. 260-669.00R.

Croisier, Jean-Paul. Anti-theft device for a vehicle. 3,938,079, Cl. 340-64.000.

Crucible Inc: *See—*
Salvadore, Eugene A.; and Zimmerman, Paul J., 3,937,269.

CSR Limited: *See—*
Luxford, Ronald William Alexander, 3,937,318.

Cubic Handling Systems N.V.: *See—*
van der Laan, Hans Robert, 3,937,346.

Cummins, Donald L., to General Motors Corporation. Electrical generating system overvoltage protection circuit. 3,938,005, Cl. 317-13.00R.

Cunningham, Jerry L. Illuminated fishing tackle box. 3,938,132, Cl. 340-321.000.

Cunningham, Joseph A.; and White, Jimmy L., to H. C. Price Co. Internal pipe clamp with weld backup. 3,937,382, Cl. 228-49.000.

Cunningham, Willis C.: *See—*
Shryock, Stanley H.; George, Charles R.; and Cunningham, Willis C., 3,937,282.

Curtis Products Lt.: *See—*
Tacke, William H., 3,937,434.

Cusic, John W.; and Ellefson, Charles R., to G. D. Searle & Co. 1-(10-Cyano/halo-5H-dibenzo[a,d]cycloheptен-5-yl)-4-[(pyridylmethylene)amino]piperazines. 3,937,701, Cl. 260-240.00G.

Dabanian, Karnig H.; Rapp, Lawrence F.; and Good, Dale C., to Cox Instrument Division, Lynch Corporation. Vortex flowmeter. 3,937,081, Cl. 73-194.00C.

Dahl, Ernest A. Induction charging system. 3,938,018, Cl. 320-2.000.

Dahlgren, Harold P. Dampener for lithographic printing plates. 3,937,141, Cl. 101-148.000.

Dahlin, Carl Erik Ingemar, to von Tell Trading Co. AB. Arrangement in cargo hatches on ship weather decks. 3,937,169, Cl. 114-202.000.

Dalton, Virgil D. Dolly for moving and positioning vehicles. 3,937,479, Cl. 280-3.000.

Damon Corporation: *See—*
Sodickson, Lester A.; and Lim, Franklin, 3,937,614.

Damon, Melvin H., Jr.: *See—*
Anderson, Warren A.; Rosenberg, Lawrence; and Damon, Melvin H., Jr., 3,936,954.

Damour, Lawrence R. Expanding outer sleeve for a mandrel or chuck. 3,937,412, Cl. 242-72.00B.

Danfoss A/S: *See—*
Stannow, Jorgen; Kjeldsen, Kjeld; Karll, Bent; and Nissen, Ole Joker, 3,937,598.

Daniels, Everette E. Bumper support for a boat loader. 3,937,375, Cl. 224-42.070.

Daniels, Peter, to United States of America, Navy. Internal stabilizing device for air and water missiles. 3,937,144, Cl. 102-2.000.

Danneberg, Peter: *See—*
Mentrup, Anton; Renth, Ernst-Otto; Schromm, Kurt; and Danneberg, Peter, 3,937,708.

Dano, Paul K., to Del Norte Technology, Inc. Secure encoder for trilateralization locator utilizing very narrow acceptance periods. 3,938,146, Cl. 343-6.5LC.

Darack, John R.: *See—*
Nickerson, John T. R.; and Darack, John R., 3,937,814.

Dart Industries Inc.: *See—*
Castagna, Eugene G., 3,937,758.

Davies, Jenkins Eric: *See—*
Van Dijk, Jan; and Davies, Jenkins Eric, 3,937,841.

Davis, Charles H. Emergency sign device. 3,936,967, Cl. 40-129.00C.

Davis, Donald E.: *See—*
Belew, Robert R.; and Davis, Donald E., 3,936,942.

Davis, Harry J.; and Rongus, Leo P., to United States of America, Army. Dual signature safety and arming mechanism. 3,937,146, Cl. 102-78.000.

Davis, R.: *See—*
Davis, Raymond D.; and Plant, Z. Y., Jr., 3,938,078.

Davis, Raymond D.; and Plant, Z. Y., Jr., to Davis, R.; Plant, Z. Y.; and Tribbey, W. Low tire pressure indicating device. 3,938,078, Cl. 340-58.000.

Davis, Robert: *See—*
Wiley, Paul J.; and Davis, Robert, 3,937,774.

Day, Leslie R., to Young Communications Corporation. Miniature display communicator. 3,938,139, Cl. 340-324.00R.

De Laval Separator Company, The: *See—*
Zitke, Ernest John; and Horton, Donald Dickinson, 3,937,397.

Dea, Frank Jeng; and Schroer, Richard Allen, to Nelson Research & Development Co. Topical anti-inflammatory compositions and methods of use. 3,937,823, Cl. 424-210.000.

Dean, Joe O. Door security pin. 3,937,506, Cl. 292-300.000.

Debrunner, Peter; and Frauenfelder, Hans, to University of Illinois Foundation. Digital signal averager with logarithmic time base. 3,937,943, Cl. 235-183.000.

de Carle, John Trevor, to Global Vision, Inc. Hydrophilic gel terpolymers from hydrophilic N-vinyl monomers, hydroxyalkyl acrylates or methacrylates and polymerizable unsaturated carboxylic acids. 3,937,680, Cl. 260-29.6TA.

DeClue, Larry W.; and Muller, Harold H., to Fairchild Camera and Instrument Corporation. Active termination network for clamping a line signal. 3,937,988, Cl. 307-237.000.

Deere & Company: *See—*
Lange, Henry James; McCunn, Myron Lee; Berk, Martin Adolph; Classen, Peter Jay; and Allen, David Thomas, 3,938,016.

Deering Milliken Research Corporation: *See—*
Klein, Norman E.; and Stewart, William H., Jr., 3,937,045.

DeFrancesco, Richard E.; Harris, Bernard; and Hoffman, David, to United States of America, Navy. Digital flutter reduction system. 3,938,184, Cl. 360-51.000.

Deix, Jean, to Le Bouchage Mecanique. Bottle stoppering apparatus. 3,936,991, Cl. 53-76.000.

DeJule, Michael C.; and Glaser, David, to Zenith Radio Corporation. Gas discharge display device and an improved cell therefor. 3,938,135, Cl. 340-324.00M.

Dekeyser, Willy Rene Evarist: *See—*
Mortier, Frans Henri; Dekeyser, Willy Rene Evarist; and Sadler, Loren Gage, 3,936,994.

de Kock, Cornelis, to ITT Industries, Inc. Arrangement for adjusting the damping force of a shock absorber. 3,937,307, Cl. 188-319.000.

Del Norte Technology, Inc.: *See—*
Dano, Paul K., 3,938,146.

Delaney, Thomas James; and Pierson, William Grant, to Colgate-Palmolive Company. Toothpaste. 3,937,321, Cl. 206-84.000.

Delaney, Thomas James; and Pierson, William Grant, to Colgate-Palmolive Company. Flavored dental creams. 3,937,803, Cl. 424-49.000.

Delaney, Thomas James; and Pierson, William Grant, to Colgate-Palmolive Company. Toothpaste. 3,937,804, Cl. 424-52.000.

Del Bon, Franco. Automatically opening and closing closure device. 3,937,371, Cl. 222-494.000.

Del Bon, Franco, to Trisa Burstenfabrik AG. Fountain toothbrush. 3,937,582, Cl. 401-134.000.

DeLong, Donald C.; and Gerzon, Koert, to Eli Lilly and Company. Method for treating psoriasis. 3,937,822, Cl. 424-181.000.

Demarest, Donald M., to General Electric Company. Gate pulse power supply for static alternating current switch. 3,938,032, Cl. 323-24.000.

Demole, Edouard P., to Firmenich SA. Aromatic compositions. 3,937,228, Cl. 131-17.00R.

Dempsey, Edward, to Lawrence Peska Associates, Inc., a part interest. Electric hood latch for vehicles. 3,937,505, Cl. 292-201.000.

Denenberg, Jeffrey Neil, to Bell Telephone Laboratories, Incorporated. Tone detector using spectrum parameter estimation. 3,937,899, Cl. 179-84.0VF.

Denki Onkyo Co., Ltd.: *See—*
Horikawa, Hideichi; Katayama, Shitomi; Serita, Hajime; and Masuda, Noboru, 3,937,764.

de Radzitzky d'Ostrowick, Pierre M. J. G.; and Camerman, Philippe J. A., to Labofina S. A. Hydrocarbon conversion. 3,937,739, Cl. 260-604.00R.

Desai, Samir Thakorbhai, to Motorola, Inc. Public address/radio switching system. 3,938,043, Cl. 325-18.000.

DeSoto, Inc.: *See—*
Jansons, Eric G., 3,936,907.

Destame, Daniel Paul Henri, to U.S. Philips Corporation. Apparatus for converting visually legible numerical characters into a binary code. 3,938,186, Cl. 340-146.30Z.

Detraz, Jacques: *See—*
Fund, Jean Claude; and Detraz, Jacques, 3,937,097.

Devaud, Jacques, to Grouzet. Static non-swinging course determining device on a vehicle. 3,936,949, Cl. 33-352.000.

Devine, Joseph C. Dual frame rocker trailer. 3,937,413, Cl. 242-86.50R.

DeVito, Albert P., to Palmer Industries Ltd. High voltage grounding strap. 3,937,995, Cl. 313-49.000.

DeVito, Albert P.: *See—*
Maximoff, Paul A.; and DeVito, Albert P., 3,937,553.

de Winter, Jan Gerrit, to Nicolon B.V. Bed for growing mushrooms and the like. 3,936,975, Cl. 47-1.100.

Dickinson, Lawrence Chapman. Snow cat. 3,937,289, Cl. 180-9.440.

Diehl, Roy E.: *See—*
Cook, Robert R.; and Diehl, Roy E., 3,937,196.

Diepering, Gerrit J.: *See—*
Nicholson, David W.; and Diepering, Gerrit J., 3,937,176.

Dietterich, Charles W., to White-Westinghouse Corporation. Molded plastic refrigerator pan and window assembly. 3,937,537, Cl. 312-204.000.

Dillenschneider, Jean-Paul, to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie. Pneumatic tires. 3,937,862, Cl. 428-409.000.

Dillingham Corporation: *See—*
Martin, Charles H.; and Brewer, Steven V., 3,937,442.

Dillon, Roger L.: *See—*
Nystuen, Marcus I.; and Dillon, Roger L., 3,937,981.

Dinning, Robert W., to Macco Oil Tool Company, Inc. Artificial lift well apparatus. 3,937,280, Cl. 166-224.00R.

DiPace, Gino: *See—*
Kopich, Leonard F.; and DiPace, Gino, 3,937,603.

DiPaola, Philip J.; and Boye, Charles M. Holder. 3,937,451, Cl. 269-45.000.

Direct Access Corporation: *See—*
Semmlow, John Leonard; and Stark, Lawrence, 3,938,190.

Dirigo Corporation: *See—*
Nickerson, John T. R.; and Darack, John R., 3,937,814.

Disque, Donny R.: *See—*
Koerner, Ernest C.; and Disque, Donny R., 3,937,673.

Dittmann, Larry Eugene, to AMP Incorporated. Device for splicing wire. 3,937,548, Cl. 339-95.00D.

Dixon, Arthur B.: *See—*
Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce F., 3,937,365.

Dixon, James R.; and Jones, Charles M., to Ford Motor Company. Staggered configuration for wankel engine spark plugs. 3,937,185, Cl. 123-8.010.

Doak, Lyle E. Bilge pump. 3,937,168, Cl. 114-183.00A.

Doblin, Jay: *See—*
Tucker, James E.; and Doblin, Jay, 3,937,231.

Dobson, Donald R.; and Williams, Robert A., to International Business Machines Corporation. Differential capacitive position encoder. 3,938,113, Cl. 340-200.000.

Dr. C. Otto & Comp. G.m.b.H.: *See—*
Pries, Erich; and Drebes, Friedrich-Wilhelm, 3,937,656.

Docutel Corporation: *See—*
Hickey, Richard C.; Swafford, Jerry W.; Swartzendruber, Robert F.; and Barnes, Thomas P., 3,937,453.

Dodge, Thomas W.; Rinkleib, Helfried O.; and Rueger, William J., to International Business Machines Corporation. Cartridge with lock stabilization. 3,937,325, Cl. 206-387.000.

Doerfler, Roger E.: *See—*
Ayers, David T., Jr.; Doerfler, Roger E.; and Stelzer, William, 3,937,523.

Dols, Peter L. M., to Stamicarbon B.V. Process for the preparation of cyclohexanone. 3,937,735, Cl. 260-586.00P.

Dominguez, David G.: *See—*
Wolf, Ludwig, Jr.; and Dominguez, David G., 3,937,064.

Dompas, John M. A., to Hazelett Strip-Casting Corporation. Belt back-up apparatus and coolant application means for twin-belt casting machines. 3,937,274, Cl. 164-278.000.

Donakowski, William A.: *See—*
Cordone, Leonard G.; Donakowski, William A.; and Morgan, John R., 3,937,266.

Donati, Ivo; Muench, Werner; and Fidecicchi, Mario, to Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Process for the neutralization of acid solutions of caprolactam. 3,937,789, Cl. 423-549.000.

Donner, Meinrad: *See—*
Ruffner, Heinz E.; and Donner, Meinrad, 3,936,946.

Donovan, William J.; and Frey, G. Robert, to Joy Manufacturing Company. Protective canopy. 3,937,517, Cl. 296-68.000.

Dorer, Wilfried, to Mathias Bauerle GmbH. Envelope filling machine. 3,936,993, Cl. 53-266.00A.

Dorleijn, Jan Willem Frederik: *See—*
Rooijmans, Coenraad Jozef Maria; Druyvesteyn, Willem Frederik; and Dorleijn, Jan Willem Frederik, 3,938,111.

Dorren, Louis, to Quadracast Systems, Inc. Cartridge muting circuit. 3,937,902, Cl. 179-100.40A.

Dorsch, Robert R., to Du Pont de Nemours, E. I., and Company. Zeeman effect atomic absorption spectrometer. 3,937,577, Cl. 356-85.000.

Doucette, Eugene F., to Owens-Illinois, Inc. Turret device for supplying articles from plural magazines. 3,937,360, Cl. 221-11.000.

Douwe Egberts Tabaksfabriek-Koffiebranderijen-Theehandel B.V.: *See—*
Molenaar, Albert Meijlom; and Veenstra, Melle, 3,937,134.

Dow Chemical Company, The: *See—*
Blauer, Roland E.; and Durborow, Clarence J., 3,937,283.
Griffith, Jeffrey D.; and Tobol, Helen K., 3,937,831.
Saunders, Frank L., 3,937,069.

Drebes, Friedrich-Wilhelm: *See—*
Pries, Erich; and Drebes, Friedrich-Wilhelm, 3,937,656.

Drewett, Glen E. Bumper guard and arrangement for water covered areas. 3,937,170, Cl. 114-219.000.

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Funke, Herman D., to Medtronic, Inc. Arrhythmia prevention apparatus. 3,937,226, Cl. 128-419.00D.
Furia, Thomas Edward: *See—*
Bellanca, Nicolo; and Furia, Thomas Edward, 3,937,851.
Furuichi, Katsushi; Kurita, Kenji; Kimura, Yoshimasa; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Temperature control system. 3,937,921, Cl. 219-494.000.
Futaki, Kiyoshi: *See—*
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Futamura, Shingo: *See—*
Cole, William Max; and Futamura, Shingo, 3,937,760.
G. D. Searle & Co.: *See—*
Cusic, John W.; and Ellefson, Charles R., 3,937,701.
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G. Leblanc Corporation: *See—*
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G. Siempelkamp & Co.: *See—*
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Gadwal, Govind Rao; and Stanek, Eldon Keith, to United States of America, Interior. Active negative sequence cable monitor. 3,938,006, Cl. 317-18.00C.
Gaertner, Wolfgang W.: *See—*
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GAF Corporation: *See—*
Strobel, Albert F., 3,937,808.
Gafgen, Klaus: *See—*
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Gahler, Lester, to Advanced Drainage Systems, Inc. Apparatus for covering drainage tubing with fine textured soil granules. 3,936,961, Cl. 37-142.500.
Galis, Alex J. Level wind device. 3,937,420, Cl. 242-158.40A.
Galvin, Aaron A.; and Shapiro, L. Dennis, to American District Telegraph Company. Multizone intrusion alarm system. 3,938,118, Cl. 340-258.00R.
Gammerman, Mikhail Yakovlevich: *See—*
Fix, Izrail Grigorievich; Morokhovsky, Alexei Sergeevich; Gammerman, Mikhail Yakovlevich; Khaitin, Benno Abramovich; Laar, Tynis Eduardovich; and Mezhburd, Volf Iolevich, 3,937,080.
Gancy, Alan Brian; and Wamser, Christian Albert, to Allied Chemical Corporation. Treatment of chromium ore residues to suppress pollution. 3,937,785, Cl. 423-53.000.
Gaon, David E.: *See—*
Grzybowski, George T.; Gaon, David E.; Gearing, Bryan F.; and Winandy, Martin R., 3,937,894.
Garcea, Giampaolo; Police, Gennaro; and Ciccarone, Angelo, to Alpha Romeo S.p.A. Mixture carburation device for the operation in idling conditions in progression of an internal combustion engine. 3,937,766, Cl. 261-41.00D.
Garcia, Gary L.: *See—*
Grahl, Darwin R.; and Garcia, Gary L., 3,937,029.

Garcia, Jean; Hareng, Michel; and Leiba, Eugene, to Thomson-CSF. Data display device. 3,938,140, Cl. 340-336.000.

Garconnat, Michel: *See—*
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Gardner, Delbert J.: *See—*
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Gardner, James Earl, deceased: *See—*
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Gardner, Patricia, executrix: *See—*
Allcock, Harry Rex; Gardner, James Earl, deceased; and Smeltz, Karen M., 3,937,790.

Garlic, Richard A., to Xerox Corporation. Input/output connection arrangement for microprogrammable computer. 3,938,098, Cl. 340-172.500.

Garrison, David H., Jr., deceased; and by Alfieri, Richard J., executor. Ceiling panel trim mounting means. 3,936,990, Cl. 52-717.000.

Gartner, Robert. Screw drive. 3,937,089, Cl. 74-25.000.

Garwood, William E.; Chen, Nai Yeun; and Lucki, Stanley J., to Mobil Oil Corporation. Alumina removal from crystalline alumino-silicates with Cr(III) solutions. 3,937,791, Cl. 423-328.000.

Gasser, Andreas: *See—*
Bruhlmeier, Josef; and Gasser, Andreas, 3,937,132.

Gastineau, Paul E. Engraving machines. 3,937,873, Cl. 178-6.60B.

Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, to Fisons Limited. 2,3-Dihydro-2-aminobenzofuran-5-yl sulfonates. 3,937,702, Cl. 260-247.10S.

Gath, Karl Heinz. Method and apparatus for manufacturing continuous form sets. 3,937,452, Cl. 270-39.000.

Gauthier, John A., to GTE Automatic Electric (Canada) Limited. Precision control of relay operate and release times. 3,938,009, Cl. 317-148.50R.

Gay, James E., to Mobility, Inc. Dump box assembly. 3,937,502, Cl. 298-11.000.

Gay, Michael J., to Motorola, Inc. Control circuit for a matrixed four channel audio reproducing system. 3,937,885, Cl. 179-1.0GQ.

Gaylord, John F., Jr., to Medical Specialties, Inc. Decubitus pad. 3,937,218, Cl. 128-149.000.

Gaynor, Joseph; Anderson, Terry G.; Hines, Walter; and Tyler, Len A., to Bell & Howell Company. Apparatus for inductive electrophotography. 3,937,572, Cl. 355-16.000.

Gearing, Bryan F.: *See—*
Grzybowski, George T.; Gaon, David E.; Gearing, Bryan F.; and Winandy, Martin R., 3,937,894.

Gebruder Netzsch Maschinenfabrik: *See—*
Klimaschka, Norbert, 3,937,406.

Gee, Thomas A., to Eaton Corporation. Tubular wheel speed sensor. 3,938,112, Cl. 340-195.000.

Geeson, Robert Ernest, to Metal Box Limited. Web feeding apparatus. 3,937,112, Cl. 83-57.000.

Gehrig, Heinz: *See—*
Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; Fauth, Karl-Heinz; and Gehrig, Heinz, 3,937,772.

Gehrke, Gerard William, to Torrington Company, The. Overrunning clutch. 3,937,311, Cl. 192-45.000.

Gehrke, Gerard William, to Torrington Company, The. Retainer for roller clutch. 3,937,312, Cl. 192-45.000.

Geiger, Rolf: *See—*
Mager, Adolf; Schone, Hans-Hermann; Geiger, Rolf; and Enzmann, Franz, 3,937,820.

Geis, Warren P.; and Liegel, Reinald D., to Koehring Company. Vehicle having transverse leveling means. 3,937,339, Cl. 214-140.000.

Geiser, Edward M., to Universal Oil Products Company. Rehabilitation of water-damaged electrical equipment. 3,937,856, Cl. 427-58.000.

Genbauffe, Francis S., to Robertshaw Controls Company. Plural range pressure regulator construction or the like and the method of making the same or the like. 3,936,919, Cl. 29-157.10R.

General Dynamics Corporation: *See—*
Tucker, Roy G.; Fruzzetti, Ernest G.; Ribak, Charles R.; and Bricknell, Russell C., 3,937,333.

General Electric Company: *See—*
Cap, Daniel M., 3,937,996.
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Loeb, Leopold, 3,937,042.
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Schowe, Lester F., Jr., 3,938,082.
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General Mills Chemicals, Inc.: *See—*
Rogier, Edgar R.; Jevne, Allan H.; and Schwebke, Gerald L., 3,937,687.
Rogier, Edgar R.; Jevne, Allan H.; and Schwebke, Gerald L., 3,937,688.

General Mills, Inc.: *See—*
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General Motors Corporation: *See—*
Aspinwall, Robert H., 3,937,013.
Bierlein, Carl A.; and Schaefer, Ernest D., 3,937,020.
Bright, James A., 3,937,032.
Cummins, Donald L., 3,938,005.
Harkrader, Ronald L.; and Kimberlin, Dan R., 3,937,243.
Hartleroad, Ronald J.; and Grabowski, James P., 3,937,386.
Jaffe, James M.; and Seto, John Y. W., 3,938,175.
Kopich, Leonard F.; and DiPace, Gino, 3,937,603.
Lentz, Carl A., 3,937,107.
Longhouse, Richard E., 3,937,192.
MacGregor, Benjamin N.; and Wilson, Arnold I., 3,937,440.
Smith, Claude A.; and Williams, Donald L., 3,937,358.
Staker, William C.; and Lehnhoff, Richard N., 3,938,022.
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General Oceanus, Inc.: *See—*
Williams, Gerald J., 3,937,078.

General Signal Corporation: *See—*
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Neuhof, Jacob, 3,938,141.

General Time Corporation: *See—*
Lundin, Robert S.; and Keutzer, Richard K., 3,937,096.

Gentiluomo, Joseph A. Golf game. 3,937,475, Cl. 273-176.0FA.

Geophysical Systems Corporation: *See—*
Fort, J. Robert; Westphal, James A.; and Juilfs, Donald R., 3,938,073.

George, Brian Victor, to British Nuclear Design & Construction Ltd. Nuclear power installations. 3,937,652, Cl. 176-60.000.

George, Charles R.: *See—*
Shryock, Stanley H.; George, Charles R.; and Cunningham, Willis C., 3,937,282.

Gerber, Rudolf. Method and apparatus for making filter electrodes. 3,936,932, Cl. 29-628.000.

Gerei, Lajos: *See—*
Bathory, Judit; Ery nee Nagy, Marta; Gerei, Lajos; Lakatos, Ferenc; Stiller nee Kisteleki, Magdolna; and Vaghy, Tamas, 3,937,694.

Gerhardt, Klaus, to G. Siempelkamp & Co. Method of and means for cooling support trays for hot-pressed boards. 3,937,316, Cl. 198-156.000.

Gerzon, Koert: *See—*
DeLong, Donald C.; and Gerzon, Koert, 3,937,822.

Gilbert, Howard E. Adjustable frame. 3,936,968, Cl. 40-155.000.

Gilbreath, William P.: *See—*
United States of America, National Aeronautics and Space Administration; Gilbreath, William P.; Adamson, Michael J.; and Fassbender, Alexander G., 3,938,035.

Giles, Dion Ewing: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,937,657.

Giles, Michael K.; and Freitag, Walter E., to United States of America, Navy. Photoparametric amplifying upconverter. 3,937,979, Cl. 307-88.300.

Gillemot, George W., to Thompson, John T., a part interest. Snap-in, snap-out terminal block and mounting member therefor. 3,937,550, Cl. 339-198.00G.

Gillette Company, The: *See—*
Tucker, James E.; and Doblin, Jay, 3,937,231.

Gillon, John: *See—*
Gates, Peter Stuart; Gillon, John; and Saggers, David Thomas, 3,937,702.

Gionis, John; Ebel, Mark S.; and Regitz, William M., to Intel Corporation. High speed ECL compatible MOS-Ram. 3,938,109, Cl. 340-173.00R.

Girling Limited: *See—*
Allen, Brian Robert; and Harrison, Anthony William, 3,937,303.
Brix, Hermann, 3,937,304.
Ingram, Brian; and Riddoch, Henry Jamieson, 3,937,524.

GKN Transmissions Limited: *See—*
Abbott, Randle Leslie, 3,937,313.
Fisher, Leslie George; and Palmer, Bertram Joseph, 3,937,035.

Glance, Patrick M.; Moroney, James E.; and Ross, Peter M., Jr., to Ford Motor Company. Vehicle body and bumper assembly. 3,937,508, Cl. 293-63.000.

Glaser, David: *See—*
DeJule, Michael C.; and Glaser, David, 3,938,135.

Glasson, Jerry M.; and King, Ira S., to Teletype Corporation. Digital demodulator for phase-modulated waveforms. 3,938,052, Cl. 329-104.000.

Gliever, John H.; and Chu, David C., to Hewlett-Packard Company. Measurement averaging counting apparatus employing a randomly phase modulated time base to improve counting resolution. 3,938,042, Cl. 324-186.000.

Global Vision, Inc.: *See—*
de Carle, John Trevor, 3,937,680.

Godel, Julius B.; Guillaume, Marcel; Lambrecht, Richard M.; and Withnell, Ronald, to United States of America, Energy Research and Development Administration. Accelerator beam profile analyzer. 3,937,966, Cl. 250-393.000.

Goeth, Hanns: *See—*
Schroder, Ludwig; Thomas, Klaus; and Goeth, Hanns, 3,937,712.

Gogarty, William B.: *See—*
Knight, Bruce L.; Rhudy, John S.; and Gogarty, William B., 3,937,633.

Golan, Kenneth F.; and Oetzel; Larry W., to Caterpillar Tractor Co. Pressure relief adjustment means for check valve. 3,937,250, Cl. 137-543.170.

Goldmark Communications Corporation: *See*—
Goldmark, Peter C., 3,938,189.

Goldmark, Peter C., to Goldmark Communications Corporation. System for recording and playing back individual frames of video and related audio signals. 3,938,189, Cl. 360-8.000.

Goloschapov, Nikolai Mikhailovich: *See*—
Reznik, Vladimir Savich; Pashkurov, Nikolai Grigorievich; Muslinkin, Abdurakhim Abdurakhimovich; Zhurkina, Elena Nikolaevna; Goloschapov, Nikolai Mikhailovich; and Steklovsky, Vladimir Konstantinovich, 3,937,829.

Good, Dale C.: *See*—
Dabanian, Karnig H.; Rapp, Lawrence F.; and Good, Dale C., 3,937,081.

Goodridge, William C., to Electrostatic Equipment Corporation. Particle cloud coating method and apparatus. 3,937,179, Cl. 118-301.000.

Goodyear Aerospace Corporation: *See*—
Ruof, Edgar J., 3,937,526.

Goodyear Tire & Rubber Company, The: *See*—
Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., 3,937,753.
Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., 3,937,755.
Morheng, Marcel J., 3,937,606.
Wideman, Lawson G.; and Menapace, Henry R., 3,937,745.

Goransson, Eric: *See*—
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Gordon, Robert Louis, to International Paper Company. Suspended carton within a carton. 3,937,328, Cl. 206-521.000.

Gordon Smith & Co., Inc.: *See*—
Ostwald, Richard, 3,937,276.

Gordon, Woodford W. Transport case for gnathological apparatus and gnathostomatic appliances. 3,936,937, Cl. 32-1.000.

Gorim, Everett; Kulik, Metro D.; and Struck, Robert T., to Continental Oil Company. Treatment of gases containing sulfur dioxide. 3,937,788, Cl. 423-242.000.

Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., to Continental Oil Company. Treatment of gases containing sulfur dioxide. 3,937,787, Cl. 423-242.000.

Gould, Inc.: *See*—
Bourke, Robert F., 3,938,020.

Goyman, William: *See*—
Beckwith, Sterling; Vogel, Robert E.; and Goyman, William, 3,937,033.

Grabb, Frederick G.; Owens, Carl D.; and Gardner, Delbert J., to Bendix Corporation, The. Reaction hold-off means for a two stage servomotor. 3,937,126, Cl. 91-6.000.

Grabb, Frederick G.: *See*—
Sisco, William C.; and Grabb, Frederick G., 3,937,021.

Grabowski, James P.: *See*—
Hartleroad, Ronald J.; and Grabowski, James P., 3,937,386.

Grahl, Darwin R.; and Garcia, Gary L., to Parker-Hannifin Corporation. Method and apparatus for charging air conditioners with refrigerant fluid. 3,937,029, Cl. 62-77.000.

Grant, John W.: *See*—
Hicks, Leon E.; Grant, John W.; Watts, Loyal O.; and Peterson, Wayne A., 3,937,128.

Grantham, George William, to International Telephone & Telegraph Corporation. Frequency scan radar system with provision for interference elimination. 3,938,149, Cl. 343-17.10R.

Gravley, Mark L., to Phillips Petroleum Company. Filter bag cuff. 3,937,621, Cl. 55-377.000.

Greatbatch, Wilson: *See*—
Mead, Ralph T.; and Greatbatch, Wilson, 3,937,635.

Greco, Nicholas P., to Koppers Company, Inc. Production of hydroquinone. 3,937,741, Cl. 260-621.00M.

Green, Charles J., to Estes Industries Inc. Rocket launcher including remotely releasable pin latch. 3,937,191, Cl. 12.4-11.00R.

Green, Kieron Philip: *See*—
Radvan, Bronislaw; and Green, Kieron Philip, 3,937,273.

Green, Philip S.; Frohbach, Hugh F.; Schaefer, Louis F.; and Suarez, Joe R., to Stanford Research Institute. Ultrasonic camera system and method. 3,937,066, Cl. 73-67.50R.

Greer Hydraulics, Inc.: *See*—
Zahid, Abduz, 3,937,496.

Gregory, Walter J. Mitering apparatus. 3,936,935, Cl. 30-179.000.

Grib, Boris F., to Philamon Incorporated. Composite tuning fork and method of making same. 3,937,117, Cl. 84-454.000.

Griffin, Charles: *See*—
Boone, Ralph D.; and Griffin, Charles, 3,937,237.

Griffith, Jeffrey D.; and Tobol, Helen K., to Dow Chemical Company, The. Chloromethyl nitropyridines as antimicrobials. 3,937,831, Cl. 424-263.000.

Griffolyn Company, Inc.: *See*—
Flanagan, Bill, Jr., 3,936,912.

Grimes, Dale M.; Raymond, William W.; Hach, Ralph J.; and Walser, Rodger M., to McDonnell Douglas Corporation. Magnetic absorbers. 3,938,152, Cl. 343-18.00A.

Grimes, John Herbert: *See*—
Scott, Kenneth Thomas Bartlett; Grimes, John Herbert; and Ball, Peter William, 3,937,667.

Grimsdale, Richard Lawrence: *See*—
Ripley, Lionel George; and Grimsdale, Richard Lawrence, 3,937,952.

Gripnail Corporation: *See*—
Craig, J. Andrew, 3,937,380.

Griswold, Augustus W.; and Haritonoff, Boris W., to Arcata Microfilm Corporation. Microfiche support. 3,936,964, Cl. 40-104.180.

Grote, Dace: *See*—
Throckmorton, Peter E.; Frey, Sari; and Grote, Dace, 3,937,727.

Grouzet: *See*—
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Grove, John L., to Fulton Industries, Inc. Aerial platform having boom mounted pipe holder. 3,937,340, Cl. 214-147.00G.

Gruen, Herbert; Wisner, Kenneth R.; and Karp, Tony, to Driver Training Institute. Driver training simulator. 3,936,955, Cl. 35-11.000.

Gruenwald, Geza, to General Electric Company. Method of curing vacuum pressure impregnated coils. 3,937,855, Cl. 427-54.000.

Gruntfest, Irving; Turner, Rudolph; and Rebenfeld, Ludwig, to Textile Research Institute. Method of recovering constituents from polyester and cellulosic textile waste. 3,937,671, Cl. 260-2.300.

Gruntfest, Irving; and Turner, Rudolph, to Textile Research Institute. Treatment of textile waste formed of polyester and cellulosic fibers. 3,937,675, Cl. 260-2.300.

Gruodis, Romualdas K.; and Milbradt, Eugene D., to Fairchild Industries, Inc. Article stacking apparatus. 3,937,456, Cl. 271-64.000.

Grzybowski, George T.; Gaon, David E.; Gearing, Bryan F.; and Winandy, Martin R., to GTE Automatic Electric Laboratories Incorporated. Addressable ticketing scanner. 3,937,894, Cl. 179-7.10R.

GTE Automatic Electric (Canada) Limited: *See*—
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Guala, Piergiacomo, to Angelo Guala S.p.A. Security bottle closure device. 3,937,348, Cl. 215-252.000.

Guenther, Lloyd M., to Chevron Research Company. Apparatus for tensioning yarn. 3,937,417, Cl. 242-147.00R.

Guillaume, Marcel: *See*—
Godel, Julius B.; Guillaume, Marcel; Lambrecht, Richard M.; and Withnell, Ronald, 3,937,966.

Gundacker, Siegbert; and Badertscher, Gerhard, to Plascon AG. Method of operating an electrode-type water-vapor generator. 3,937,920, Cl. 219-286.000.

Guntner, Herwig, to Siemens Aktiengesellshaft. Postioning apparatus for tracked transport vehicles with linear motor propulsion. 3,937,431, Cl. 246-182.00B.

Gusman, Irwin J.; and Strack, Carlo, to J. P. Stevens & Co., Inc. Filtration material. 3,937,860, Cl. 428-228.000.

Gustafsson, Rolf Erik Olof, to Telefonaktiebolaget L M Ericsson. DC to DC converter for producing two individually controlled and stabilized DC-voltages. 3,938,025, Cl. 321-2.000.

Gutcho, Sidney; Rapun, Raul; Rutner, Herman; and Charig, Andrew, to Becton, Dickinson & Company. Tritiated derivatives of cyclic nucleotides monophosphates. 3,937,698, Cl. 260-211.50R.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See*—
Bammert, Karl, 3,937,592.
Krolmann, Siegfried; and Heinen, Bruno, 3,937,277.

Guttler-Pimenidou, Eftichia: *See*—
Kolbel, Herbert; Manecke, Georg; and Guttler-Pimenidou, Eftichia, 3,937,685.

Gyory, Emeric J., to Borg-Warner Corporation. Mechanical seal system. 3,937,477, Cl. 277-25.000.

Gyromat Corporation, The: *See*—
Wiggins, Richard F., 3,937,180.

H. C. Cook Company, The: *See*—
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H. J. Langen & Sons Ltd.: *See*—
Langen, Marinus J. M., 3,937,458.

Haaga, Hermann. Sweeper having at least one side brush. 3,937,174, Cl. 15-42.000.

Hach, Ralph J.: *See*—
Grimes, Dale M.; Raymond, William W.; Hach, Ralph J.; and Walser, Rodger M., 3,938,152.

Hackstein, Guenter; Holdinghausen, Paul; and Homilius, Karl, to Carl Schenck AG. Unbalance vector display device and process. 3,938,134, Cl. 340-324.00M.

Haddock, Louis A., to Clark Equipment Company. Operator hand control for industrial lift trucks. 3,937,294, Cl. 180-77.00R.

Haede, Werner: *See*—
Stache, Ulrich; Fritsch, Werner; Haede, Werner; and Lindner, Ernest, 3,937,697.

Haefele, John William, to Procter & Gamble Company, The. Oral compositions for plaque, caries, and calculus retardation with reduced staining tendencies. 3,937,807, Cl. 424-52.000.

Haefele, Louis R.: *See*—
Ezzell, Bobby R.; Fluck, Eugene R.; and Haefele, Louis R., 3,937,710.

Hagan, Charles. Electrical plug and outlet unit. 3,938,068, Cl. 337-189.000.

Hagen, Magnus F.; and Jordan, Fred A. Telescoping drawer slide section for 2-member telescopic ball bearing slides affording full extension. 3,937,531, Cl. 308-3.800.

Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., to Goodyear Tire & Rubber Company, The. Acid dyeable polyesters. 3,937,753, Cl. 260-860.000.

Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., to Goodyear Tire & Rubber Company, The. Polyesters having improved disperse dyeability. 3,937,755, Cl. 260-860.000.

Halley, James L., to Tesco Chemicals, Inc. Jet action chemical feeding method. 3,937,399, Cl. 239-1.000.

Halliburton Company: *See—*
Shryock, Stanley H.; George, Charles R.; and Cunningham, Willis C., 3,937,282.

Hamaguchi, Yoshiharu, to France Bed Co., Ltd. Apparatus for manufacturing corner springs. 3,937,256, Cl. 140-71.00R.

Hamamoto, Hiroshi: *See—*
Kimura, Takashi; Majima, Azusa; and Hamamoto, Hiroshi, 3,937,630.

Hamasaka, Paul A. Handlebar extender. 3,937,629, Cl. 74-551.800.

Hammer, Klaus-Dieter: *See—*
Busch, Walter; Hammer, Klaus-Dieter; and Klendauer, Wolfgang, 3,937,672.

Hammerel, James T., to Cobbledick-Kibbe Glass Company. Sheet glass supporting rack. 3,937,329, Cl. 211-41.000.

Hamstra, David C., to General Electric Company. Control system. 3,937,922, Cl. 219-501.000.

Han, Shu Tang: *See—*
Chance, James L.; and Han, Shu Tang, 3,936,953.

Han, Youn W.; and Anderson, Arthur W., to United States of America, Agriculture. Semi-solid fermentation of straw. 3,937,845, Cl. 426-53.000.

Han, Youn W.; Pence, James W.; and Anderson, Arthur W., to United States of America, Agriculture. Process for improving the digestibility of hemicellulose-free straw. 3,937,849, Cl. 426-442.000.

Hanagan, Michael W., to Corbin Gentry, Inc. Motor mount for electric powered motorcycle. 3,937,291, Cl. 180-33.00A.

Hanasaka, Yasuaki: *See—*
Nakanishi, Kenzo; and Hanasaka, Yasuaki, 3,938,077.

Hancock, Norman Lee. Interlocking building block. 3,936,989, Cl. 52-593.000.

Handa, Kenichi, to Fuji Xerox Co., Ltd. Magnetic brush type developing mechanism in electrophotographic copying machine. 3,937,181, Cl. 118-637.000.

Hannes Marker: *See—*
Korger, Heinz, 3,937,480.

Hansen, Erik, to A/S Haustrups Fabriker. Method of ascertaining and correcting workpiece turning. 3,938,036, Cl. 324-34.00R.

Hansen, Helen: *See—*
Thomas, Richard, deceased; and Thomas, Betty M., executrix, 3,937,567.

Hansen, Niels Junior; and Capp, Ronald James, to AMP Incorporated. Narrow lead contact for automatic face down bonding of electronic chips. 3,938,177, Cl. 357-72.000.

Hanson, Alden B.; and Hanson, Chris A., to Hanson Industries Inc. Ski boot with replaceable liner. 3,936,959, Cl. 36-2.5AL.

Hanson, Chris A.: *See—*
Hanson, Alden B.; and Hanson, Chris A., 3,936,959.

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Hanss, Paul: *See—*
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Harbottle, William E.: *See—*
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Hardtmann, Goetz E., to Sandoz, Inc. 1-Isopropyl-7-methyl-4-(p-fluorophenyl)-2(1H)-quinazolinone. 3,937,705, Cl. 260-251.0QB.

Hardy, Gerald D.; Plouzek, Eugene A.; and Starling, James G., to Caterpillar Tractor Co. Bolt head shroud. 3,937,299, Cl. 184-1.00R.

Hareng, Michel: *See—*
Garcia, Jean; Hareng, Michel; and Leiba, Eugene, 3,938,140.

Hargita, Tibor: *See—*
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Haritonoff, Boris W.: *See—*
Griswold, Augustus W.; and Haritonoff, Boris W., 3,936,964.

Harkrader, Ronald L.; and Kimberlin, Dan R., to General Motors Corporation. Pressure control valve. 3,937,243, Cl. 137-115.000.

Harnsberger, Bobby G., to Texaco Inc. High load self-cleaning helical spring filters. 3,937,281, Cl. 166-233.000.

Harris, Bernard: *See—*
DeFrancesco, Richard E.; Harris, Bernard; and Hoffman, David, 3,938,184.

Harris, Carson E. Rotary latch lock. 3,937,503, Cl. 292-153.000.

Harris, Lewis P., to PBI-Gordon Corporation. Fly killing composition. 3,937,826, Cl. 424-219.000.

Harris, R. G.: *See—*
Tyson, James D.; and Harris, R. G., 3,937,583.

Harris, Samuel G., to Singlepoint U.S.A. Inc. Optical aiming device employing radioluminous material. 3,937,968, Cl. 250-467.000.

Harris, William J.: *See—*
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Harrison, Anthony William: *See—*
Allen, Brian Robert; and Harrison, Anthony William, 3,937,303.

Harrison, Burton H., to Selective Educational Equipment, Inc. Thermometer. 3,937,085, Cl. 73-338.600.

Harrison, Kenneth S., to Mohasco Corporation. Recliner lounger T-cushion chair with projectible headrest and legrest, and hardware therefor. 3,937,518, Cl. 297-61.000.

Harrison, Michael, to Colgate-Palmolive Company. Method of making dentifrice compositions containing insolubilized salts of 1,6-di-(p-chlorophenyl biguanido) hexane. 3,937,805, Cl. 424-52.000.

Hartler, Nils J. C.: *See—*
Backstrom, Inga L.; Hartler, Nils J. C.; and Kringstad, Knut P., 3,937,647.

Hartleroad, Ronald J.; and Grabowski, James P., to General Motors Corporation. Flip chip cartridge loader. 3,937,386, Cl. 228-180.000.

Hartmann & Braun Aktiengesellschaft: *See—*
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Hartmann, Richard, Jr.: *See—*
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Hartsough, Albert Charles: *See—*
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Hartz, Peter: *See—*
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Harukawa, Tadatsugu: *See—*
Asako, Tsunehiko; Soma, Takenobu; Masuya, Hirotomo; Harukawa, Tadatsugu; and Miki, Takuichi, 3,937,699.

Harvey, William B. Airplane wing and method of forming same. 3,937,425, Cl. 244-123.000.

Hasberg, Jurgen: *See—*
Wienand, Michael; Hasberg, Jurgen; and Alfter, Franz-Werner, 3,937,777.

Hasebe, Nobuyasu. Desulfurizing process for hydrogen sulfide-containing gases. 3,937,795, Cl. 423-573.00G.

Hashimoto, Yukio: *See—*
Osaka, Motomi; and Hashimoto, Yukio, 3,937,843.

Hasunuma, Masao: *See—*
Yasuda, Zenpachi; Koizumi, Hiroshi; Hasunuma, Masao; and Oda, Satoshi, 3,937,678.

Hatcher, Charles S.: *See—*
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Haueise, Rolf-Richard; and Gafgen, Klaus, to Otto Durr KG. Method of and apparatus for heating circulating air in drying equipment. 3,936,951, Cl. 34-35.000.

Hauser, Frank W., to Telautograph Corporation. Automatic stack feed. 3,937,455, Cl. 271-10.000.

Hauser, Raimund: *See—*
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Hawes, Edward L.; Hawes, Allen R.; and Hawes, Edward C. Motorcycle trailer. 3,937,489, Cl. 280-204.000.

Hawkes, Thaddeus, to Thomson-CSF. Method of and system for transcoding binary signals with reduced changeover rate. 3,937,881, Cl. 178-68.000.

Hawkins, Charles T., to PPG Industries, Inc. Reciprocating device having vibration reducing means. 3,937,092, Cl. 74-27.000.

Hayashi, Asao: *See—*
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Hayashi, Tadashi, to Nissan Motor Co., Ltd. Vehicle tire pressure sensing device. 3,938,076, Cl. 340-58.000.

Hayes, Thomas Edward, to Johnson Service Company. Anti-reset windup proportional and integral controller. 3,938,017, Cl. 318-610.000.

Hazelett, Robert William; and Wood, John Frederick Barry, to Hazelett Strip-Casting Corporation. Twin-belt continuous casting method providing control of the temperature operating conditions at the casting belts. 3,937,270, Cl. 164-50.000.

Hazelett Strip-Casting Corporation: *See—*
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Hazelett, Robert William; and Wood, John Frederick Barry, 3,937,270.

Heath Company: *See—*
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Heath, Donald P., to Mobil Oil Corporation. Economy driving aid. 3,937,202, Cl. 123-198.00R.

Heberling, Emory D., deceased: *See—*
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Heggie, William S., to Canadian Patents & Development Limited. Transducer for engine fuel injection monitoring. 3,937,087, Cl. 73-398.0AR.

Heine, Hans-Georg; Rudolph, Hans; and Fuhr, Karl, to Bayer AG. α-(Cyanoethyl)-benzoin ethers. 3,937,722, Cl. 260-465.00F.

Heine, Kurt: *See—*
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Heinen, Bruno: *See—*
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Heitzer, Xaver; and Bourggraff, Robert, to Erste Deutsche Floatglas GmbH. & Co. OHG. Method for producing a glass flow of high homogeneity in a tank furnace and an arrangement for carrying out the method. 3,937,624, Cl. 65-135.000.

Henderson, Cyril, to American Safety Equipment Corporation. Reel for storing belts or the like. 3,937,416, Cl. 242-107.40A.

Henke, Karl-Heinz: *See—*
Metzger, Adolf; Henke, Karl-Heinz; and Schreiber, Horst, 3,937,793.

Henkel & Cie GmbH: *See—*
Schwarzer, Johann; Meins, Peter; and Voparil, Kurt, 3,937,612.

Henkelmann, Kurt, to Ernst Leitz G.m.b.H. Slide projector having a partitioned magazine. 3,937,569, Cl. 353-116.000.

Henkin, Melvyn L.; and Laby, Jordan M. Automatic swimming pool cleaner. 3,936,899, Cl. 15-1.700.

Hennenberger, Peter: *See—*
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Henry, Raymond W.; and Zizzo, Anthony F., to Texas Instruments Incorporated. System for modifying a logic controller instruction set. 3,938,104, Cl. 340-172.500.

Henzler Mfg. Corporation: *See—*
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Henzler, William G.; and Parker, Robert A., to Henzler Mfg. Corporation. Workpiece translation mechanism for transfer die press. 3,937,056, Cl. 72-405.000.

Heraeus-Christ GmbH: *See—*
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Herberling, Frances L., executrix: *See—*
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Hermann, Robert R.: *See—*
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Hermstein, Wolfgang; Rosenberger, Gerhard; and Muller, Willi, to Siemens Aktiengesellschaft. Voltage measuring device for encapsulated high-voltage installations. 3,938,039, Cl. 324-96.000.

Hewitt, William J.; Shirey, Frank W.; and Wilson, Mortimer D., to Westinghouse Air Brake Company. Air purifier system. 3,937,622, Cl. 55-163.000.

Hewlett-Packard Company: *See—*
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Hickey, Richard C.; Swafford, Jerry W.; Swartzendruber, Robert F.; and Barnes, Thomas P., to Docutel Corporation. Single document transport. 3,937,453, Cl. 271-4.000.

Hicks, George E., to Weather Tec Corporation. Bleeding protective casing assembly for bearing system. 3,937,494, Cl. 285-13.000.

Hicks, Leon E.; Grant, John W.; Watts, Loyal O.; and Peterson, Wayne A., to Caterpillar Tractor Co. Hydraulic control circuit with remotely controlled dual pressure relief valve. 3,937,128, Cl. 91-392.000.

Higashide, Carlos S., to GTE Automatic Electric Laboratories Incorporated. Lamp driver for telephone panel indicator lamps. 3,938,000, Cl. 315-205.000.

Hilbrands, Jan Willem, to Maschinenfabrik Koeppern & Co. KG. Method of determining the behaviour of a shock absorber in the sprung mass system of a vehicle and a jig for performing the method. 3,937,058, Cl. 73-11.000.

Hild, Erich: *See—*
Schulz, Horst; Hild, Erich; Steuer, Werner; Schmidt, Karl-Heinz; Eisend, Ewald; Loffler, Karlheinz; Flosser, Josef; and Kessler, Reinhard, 3,937,309.

Hilding, Anderson C. Non-skid releasable sheet paper note pad. 3,937,491, Cl. 281-15.00B.

Hill, Milburn L.; and Sawyer, Ken M. Tire chain container and mounting aid. 3,937,263, Cl. 152-213.00R.

Hinderling, Rudolf: *See—*
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Hine, Edward K., Jr., to Hine-Snowbridge, Inc. Pannier bag construction and method of attachment. 3,937,374, Cl. 224-32.00A.

Hine-Snowbridge, Inc.: *See—*
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Hitachi, Ltd.: *See—*
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Hobson, Charles A., to United States of America, Navy. Automatic frequency control system. 3,938,148, Cl. 343-7.00A.

Hodges, John A. Fishing lure and method of fishing. 3,936,970, Cl. 43-17.600.

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Hoechst Aktiengesellschaft: *See—*
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Hoexter, Rolf; and Morris, Thomas M., to Mosstype Corporation. Machine for rolling and curving printing plates. 3,937,052, Cl. 72-166.000.

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Hoffmann, Manfred; Schenk, Jakob; and Leowald, Karl-Friedrich, to Siemens Aktiengesellschaft. Circuit for the simultaneous ignition of a plurality of thyristors. 3,938,026, Cl. 321-27.00R.

Hoffmeister, Bernhard, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Dual-purpose remote-control grab for fuel elements and control rods of a nuclear reactor. 3,937,513, Cl. 294-86.00A.

Hofstetter, Robert W.: *See—*
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Hold, Peter; Notte, Angelo J.; and Rizzi, Marc A., to USM Corporation. Method for controlling injection molding machines. 3,937,776, Cl. 264-40.000.

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Holloway, Raymond L. Adjustable live center adapter. 3,937,111, Cl. 82-33.00A.

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Hood, Charles B. Gas charged sprayer. 3,937,367, Cl. 222-399.000.

Hook, John W. Hair curler assembly. 3,937,233, Cl. 132-40.000.

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Hopp, Theodore H., to United States of America, Army. End fire surface wave piezoelectric transducer. 3,938,062, Cl. 333-30.00R.
Horikawa, Hideichi; Katayama, Shitomi; Serita, Hajime; and Masuda, Noboru, to Denki Onkyo Co., Ltd. Polymer electrolytes. 3,937,764, Cl. 260-895.000.
Horikiri, Shozo; Iseki, Jiro; Minobe, Masao; and Kawai, Chikanao, to Sumitomo Chemical Company, Limited. Process for production of carbon products. 3,937,775, Cl. 264-29.000.
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Huffman, Dale F.; and Zeh, Charles E., to Borg-Warner Corporation. Transmission shift control. 3,937,100, Cl. 74-476.000.
Huffman, Ronald E., to KV33 Corporation. Method of constructing dental models using guide pins and apertured retainer. 3,937,773, Cl. 264-17.000.
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Hughes, Carroll T., Jr., to Consumat Systems, Inc. Afterburner apparatus for incinerators or the like. 3,937,154, Cl. 110-8.00A.
Hughes, Donald Kent, to AMP Incorporated. Strimp. 3,937,549, Cl. 339-97.00C.
Hughes, John D.; and Klingensmith, Al W., to White-Westinghouse Corporation. Vapor saving ambient air intake system for a dry cleaner. 3,937,043, Cl. 68-18.00R.
Hulme, Edwin C., to Thurston, Kurt W.; and Selig, William L., part interest to each. System for the programmed flashing of warning lights. 3,938,080, Cl. 340-114.00B.
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Hurwitz, Mathew. Levelling attachment for ladders. 3,937,298, Cl. 182-200.000.
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Hust, Donald R.; and Heberling, Emory D., deceased (by Herberling, Frances L., executrix), to United States of America, Navy. Magnetic tape signature signal injection device. 3,938,183, Cl. 360-31.000.
Hutchins, Thomas B., IV. Electromedical patient monitoring system. 3,937,214, Cl. 128-2.10A.
Hutchinson, Homer F., to GTE Automatic Electric Laboratories Incorporated. Voltage monitor and control circuit. 3,938,023, Cl. 321-2.000.
Hutton, Roger S., to Process Systems, Inc. Fluid flow control system employing a plurality of digital valve elements. 3,937,248, Cl. 137-487.500.
Huydts, Eduard J. C.; Klassen, Alfons; and Nacke, Erich, to G. Siempelkamp & Co. System for measuring plastic deformation created by a bending press. 3,937,072, Cl. 73-100.000.
Hyder, Syed Salahuddin, to Alephtran Systems Ltd. Electronic digital system and method for reproducing languages using the Arabic-Farsi script. 3,938,099, Cl. 340-172.500.
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Klein, Norman E.; and Stewart, William H., Jr., to Deering Milliken Research Corporation. Dyeing and printing of materials. 3,937,045, Cl. 68-205.00R.
Kleinhans, Siegfried, to Siemens Aktiengesellschaft. Flywheel arrangement for an electrical machine. 3,937,103, Cl. 74-572.000.
Klendauer, Wolfgang: *See—*
Busch, Walter; Hammer, Klaus-Dieter; and Klendauer, Wolfgang, 3,937,672.
Klimaschka, Norbert, to Gebruder Netzsch Maschinenfabrik. Agitator mill. 3,937,406, Cl. 241-46.110.
Kline, Larry Harold: *See—*
Seals, Harold, 3,937,369.
Klingensmith, Al W.: *See—*
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Klockner-Humboldt-Deutz AG: *See—*
Howe, Hans-Ulrich, 3,937,201.
Klutchko, Sylvester; Brown, Richard E.; and Von Strandtmann, Maximilian, to Warner-Lambert Company. Substituted chromone-3-carbonitriles, carboxamides and carboxylic acids useful for preventing asthmatic symptoms. 3,937,837, Cl. 424-283.000.
Klutchko, Sylvester: *See—*
Kaminsky, Daniel; Klutchko, Sylvester; and von Strandtmann, Maximilian, 3,937,828.
Strandtmann, Maximilian von; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,937,704.
Kmak, Walter S.: *See—*
Yates, David J. C.; and Kmak, Walter S., 3,937,660.
Knapp, Ralph E., to Lear Siegler, Inc. Rotating arm aiming device system. 3,936,947, Cl. 33-275.00G.
Knauer, Peter. Method for identifying selected inventory items and reading the sum of their values. 3,937,929, Cl. 235-61.11R.
Knepper, Ronald W.; Lane, Ralph D.; Ludlow, Peter J.; and Moore, Barry L., to International Business Machines Corporation. Common bus driver complementary protect circuit. 3,938,008, Cl. 317-31.000.
Knierim, Gerhard: *See—*
Schmitt, Gerhard; and Knierim, Gerhard, 3,938,019.
Knight, Bruce L.; Rhudy, John S.; and Gogarty, William B., to Hercules, Incorporated. Use of radiation-induced polymers in cement slurries. 3,937,633, Cl. 106-90.000.
Knofel, Harald: *See—*
Korner, Siegfried; Meurer, Wolfgang; Knofel, Harald; Prochazka, Dieter; and Hirche, Rudi, 3,937,109.
Knorr-Bremse GmbH: *See—*
Eckhart, Alfred, 3,937,527.
Knowles, Richard N.; and Moore, Earl P., Jr., to Du Pont de Nemours, E. I., and Company. Process for preparing higher purity azo compounds. 3,937,696, Cl. 260-192.000.
Knudson, William Lewis. Dental clinic. 3,936,936, Cl. 32-1.000.
Kobe Steel Ltd.: *See—*
Asada, Tsunesaburo; Horiuchi, Takefumi; Matsumoto, Kiyoshi; Monju, Yoshiyuki; Yamaguchi, Yoshihiro; Noguti, Masataka; Nishihara, Masao; Fujita, Tatsu; and Matsushita, Tomiharu, 3,937,385.
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Kobune, Tetsuo: *See—*
Ishikawa, Kiyotsugu; Kobune, Tetsuo; Iwasa, Hitoo; and Teramoto, Iwao, 3,937,949.
Koehler, Albert M.; and Hruska, Stanley J., to Brown and Root, Inc. Method and apparatus for transporting and launching an offshore tower. 3,937,027, Cl. 61-46.500.
Koehler, Kurt, to Carl Zeiss-Stiftung. Device for the fine adjustment of an instrument table supporting an optical equipment. 3,937,099, Cl. 74-471.0XY.
Koehring Company: *See—*
Geis, Warren P.; and Liegel, Reinald D., 3,937,339.
Koerner, Ernest C.; and Disque, Donny R., to Phelps Dodge Industries, Inc. Modified amide-imide resins and method of making the same. 3,937,673, Cl. 260-18.0TN.
Koerner, Georg; and Hargita, Tibor, to Wilhelm Ruf KG. Trimming potentiometer in T or Pi network connection with parallel resistance paths. 3,938,070, Cl. 338-60.000.
Kohmura, Isao; and Futaki, Kiyoshi, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording sheets having improved stability. 3,937,864, Cl. 428-411.000.
Koizumi, Hiroshi: *See—*
Yasuda, Zenpachi; Koizumi, Hiroshi; Hasunuma, Masao; and Oda, Satoshi, 3,937,678.
Kojima, Koichi; and Kamoto, Hidetoshi, to Sony Corporation. Time switching power saver system for electronic indicators. 3,938,138, Cl. 340-324.00R.
Kokusan Denki Co., Ltd.: *See—*
Ikeda, Yoshihiko, 3,938,028.
Katsumata, Mitsuo, 3,937,190.
Kolbel, Herbert; Manecke, Georg; and Guttler-Pimenidou, Eftichia, to Hoechst Aktiengesellschaft. New polyglycidyl ethers. 3,937,685, Cl. 260-47.0EP.
Koleda, Michael T. Ski construction. 3,937,481, Cl. 280-11.35C.
Kollmorgen Corporation: *See—*
Noodleman, Samuel, 3,937,993.
Kolmar Laboratories, Inc.: *See—*
Jacobi, Otto K., 3,937,809.
Komamiya, Yasuo: *See—*
Kataoka, Shoei; Tsurushima, Toshio; Sugiyama, Yoshinobu; Tanoue, Hisao; Yamada, Hideo; and Komamiya, Yasuo, 3,938,110.
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Kondo, Asaji: *See—*
Kitajima, Masao; and Kondo, Asaji, 3,937,798.
Kondo, Mitsuru; and Misawa, Toshihiko, to Kabushiki Kaisha Ricoh. Internal test method for facsimile transceiver. 3,937,872, Cl. 178-6.000.
Koninklijke Papierfabrieken Van Gelder Zonen N.V.: *See—*
Jongetjes, Hendrik, 3,937,865.
Kononko, Vasily Porfirovich; Bondarev, Konstantin Timofeevich; Krivokon, Alexandr Alexandrovich; Kovshar, Nikolai Nikiforovich; Ivanova, Ljudmila Mikhailovna; Frolova, Elena Gavrilovna; Shestak, Nikolai Antonovich; and Shevchenko, Nikolai Leontievich. Method of making glass tubes. 3,937,623, Cl. 65-88.000.
Konrad, Hermann-Heinz: *See—*
Fuchs, Hermann; and Konrad, Hermann-Heinz, 3,937,611.
Kopernicky, Jaroslav J., to Cinex Communications Inc. Film feed device. 3,937,378, Cl. 226-55.000.
Kopich, Leonard F.; and DiPace, Gino, to General Motors Corporation. Rotary machine apex seal. 3,937,603, Cl. 418-117.000.
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Zeile, Karl; Engelhardt, Albrecht; and Traunecker, Werner, to Boehringer Ingelheim GmbH. 1-(2'Ethynyl-phenoxy)-2-hydroxy-3-(cycloalkyl-amino)-propanes and salts thereof. 3,937,706, Cl. 260-254.000.
Koppe, Herbert: *See—*
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 3,937,717.
Koppers Company, Inc.: *See—*
Greco, Nicholas P., 3,937,741.
Korger, Heinz, to Hannes Marker. Safety ski binding. 3,937,480, Cl. 280-11.35T.
Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, to Siemens Aktiengesellschaft. Apparatus for continuous feeding of granular material with sharp corners to a conveyer pipe line. 3,937,522, Cl. 302-56.000.
Korner, Siegfried; Meurer, Wolfgang; Knofel, Harald; Prochazka, Dieter; and Hirche, Rudi, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Method of manufacturing cutting and/or creasing die. 3,937,109, Cl. 76-107.00C.
Kosaka, Katuaki; Ueno, Zene; and Nagaoka, Tadahiko, to Nissan Motor Co., Ltd. Fuel oxidizer. 3,937,010, Cl. 60-39.46R.
Koschmieder, Hartmut: *See—*
Fuhrmann, Jorg; Koschmieder, Hartmut; and Schaeffler, Georg, 3,937,532.
Kosmin, Melvyn S., to United States of America, Army. Battery charging circuit with full-charge cutoff. 3,938,021, Cl. 320-40.000.
Kosonen, Ahti A., to Outokumpu Oy. Intrauterine contraceptive device. 3,937,217, Cl. 128-130.000.
Koszegi Leather & Vinyl Products, Inc.: *See—*
Artz, Kenneth W., 3,937,373.
Koth, Gerhard: *See—*
Luhdorff, Dieter; Oehlerking, Bernd; Jaworsky, Hugo; Koth, Gerhard; and Simon, Klaus-P., 3,937,525.
Kovshar, Nikolai Nikiforovich: *See—*
Kononko, Vasily Porfirovich; Bondarev, Konstantin Timofeevich; Krivokon, Alexandr Alexandrovich; Kovshar, Nikolai Nikiforovich; Ivanova, Ljudmila Mikhailovna; Frolova, Elena Gavrilovna; Shestak, Nikolai Antonovich; and Shevchenko, Nikolai Leontievich, 3,937,623.

Koyama, Masakuni, to Shinshu Miso Kabushiki Kaisha. Process for producing processed low salt soybean paste. 3,937,844, Cl. 426-46.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Reisacher, Raimund, 3,937,183.

Kraftwerkunion AG: *See—*
Remberg, Axel, 3,937,589.

Kratt, Kurt Wilhelm; and Bolsinger, Alois, to J. Hengstler K.G. System for collecting data. 3,937,924, Cl. 235-61.60R.

Krause, Janusz Josef Henryk, to Imperial Chemical Industries Limited. Apparatus for spraying paint. 3,937,400, Cl. 239-11.000.

Krauss-Maffei Aktiengesellschaft: *See—*
Schimpfle, Jorg, 3,936,952.
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,937,149.

Krehbeil, Paul R.: *See—*
Brook, Marx; and Krehbeil, Paul R., 3,938,145.

Krider, Edmund Philip, to United States of America, Navy. All-sky photoelectric lightning detector apparatus. 3,937,951, Cl. 250-209.000.

Krings, Josef. Lining apparatus for the protection of trenches. 3,937,026, Cl. 61-41.00A.

Kringstad, Knut P.: *See—*
Backstrom, Inga L.; Hartler, Nils J. C.; and Kringstad, Knut P., 3,937,647.

Krivokon, Alexandr Alexandrovich: *See—*
Kononko, Vasily Porfirovich; Bondarev, Konstantin Timofeevich; Krivokon, Alexandr Alexandrovich; Kovshar, Nikolai Nikiforovich; Ivanova, Ljudmila Mikhailovna; Frolova, Elena Gavrilovna; Shestak, Nikolai Antonovich; and Shevchenko, Nikolai Leontievich, 3,937,623.

Krolmann, Siegfried; and Heinen, Bruno, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Tubular apparatus, in particular a steam generator. 3,937,277, Cl. 165-162.000.

Kronseder, Hermann; and Wetter, Franz, to Kronseder, Hermann. Labeling device with an installation for marking labels. 3,937,642, Cl. 156-384.000.

Krulik, Gerald A.; and Sable, Harvey J., to Addressograph-Multigraph Corporation. Reproduction system utilizing ion modular and dielectric imaging surface. 3,937,571, Cl. 355-3.00R.

Krumes, Rolf, to United States of America, Army. Settable warhead burst range selector. 3,937,124, Cl. 89-6.500.

Kubota, Shigeyoshi: *See—*
Tanaka, Toyozo; Kubota, Shigeyoshi; and Kunieda, Masao, 3,936,910.

Kuehn, Harold H.: *See—*
Elkins, William; Kuehn, Harold H.; and Chamberlin, Richard H., 3,937,847.

Kulde, Harry H. Shower spray massage-sauna. 3,936,891, Cl. 4-145.000.

Kulik, Metro D.: *See—*
Gorim, Everett; Kulik, Metro D.; and Struck, Robert T., 3,937,788.
Gorin, Everett; Kulik, Metro D.; and Struck, Robert T., 3,937,787.

Kumiai Chemical Industry Co., Ltd.: *See—*
Chiyomaru, Isao; Kawada, Seigo; and Takita, Kiyoshi, 3,937,840.

Kummer, Werner: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Zeile, Karl; Engelhardt, Albrecht; and Traunecker, Werner, 3,937,706.
Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 3,937,717.

Kunieda, Masao: *See—*
Tanaka, Toyozo; Kubota, Shigeyoshi; and Kunieda, Masao, 3,936,910.

Kunstler, Hans. Combustion furnace particularly for burning refuse. 3,937,155, Cl. 110-18.00R.

Kupfer, Hans: *See—*
Rudolph, Paul; Kupfer, Hans; and Schmidt, Werner, 3,937,620.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Onozuka, Mitsuo; Nomoto, Koki; and Sato, Koji, 3,937,682.

Kurita, Kenji: *See—*
Furuichi, Katsushi; Kurita, Kenji; Kimura, Yoshimasa; and Sakamaki, Hisashi, 3,937,921.

Kuroiwa, Tsuneyoshi: *See—*
Maeda, Ichiya; and Kuroiwa, Tsuneyoshi, 3,937,267.

Kurtz, Robert L., to United States of America, National Aeronautics and Space Administration. Holographic motion picture camera with doppler shift compensation. 3,937,555, Cl. 350-3.500.

Kushner, Gerald J.; and Irish, William D., to General Electric Company. Method of assembling adhesive joint. 3,937,641, Cl. 156-87.000.

Kusmer, Kasimir. Exercising device. 3,937,462, Cl. 272-83.00R.

Kusumoto Chemicals Ltd.: *See—*
Yasuda, Zenpachi; Koizumi, Hiroshi; Hasunuma, Masao; and Oda, Satoshi, 3,937,678.

KV33 Corporation: *See—*
Huffman, Ronald E., 3,937,773.

Kyorin Seiyaku Kabushiki Kaisha: *See—*
Irikura, Tsutomu; Shirai, Kazunari; Tada, Mamoru; Tamada, Terumi; and Imai, Jun, 3,937,821.

Kysor Industrial Corporation: *See—*
Beckwith, Sterling; Vogel, Robert E.; and Goyman, William, 3,937,033.

La Soie: *See—*
Bon, Gerard, 3,937,419.

La Soudure Electrique Autogene, Procedes Arcos: *See—*
Sunnen, Jean Albert; and Schoumaker, Henry Rene, 3,937,866.

La Technique Integrale S.A.: *See—*
Fund, Jean Claude; and Detraz, Jacques, 3,937,097.

Laar, Tynis Eduardovich: *See—*
Fix, Izrail Grigorievich; Morokhovsky, Alexei Sergeevich; Gammerman, Mikhail Yakovlevich; Khaitin, Benno Abramovich; Laar, Tynis Eduardovich; and Mezhburd, Volf Iolevich, 3,937,080.

Laarkamp, Jan, to Stamicarbon N.V. Preparation of modified petroleum resins. 3,937,674, Cl. 260-19.0UA.

Labofina S. A.: *See—*
de Radzitzky d'Ostrowick, Pierre M. J. G.; and Camerman, Philippe J. A., 3,937,739.

Laboratorios Del Dr. Esteve SA: *See—*
Osaka, Motomi; and Hashimoto, Yukio, 3,937,843.

Laby, Jordan M.: *See—*
Henkin, Melvyn L.; and Laby, Jordan M., 3,936,899.

Ladin, Eli M., to Federal-Mogul Corporation. Bearing wheel assembly. 3,937,535, Cl. 308-191.000.

Laflaquiere, Regis; Janousek, Radovan; and Wettel, Albert, to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Textile machine frames. 3,936,995, Cl. 57-1.00R.

Lafuze, David Logan, to General Electric Company. Starter-generator utilizing phase controlled rectifiers to drive a dynamoelectric machine as a brushless DC motor in the starting mode with starter position sense variation with speed. 3,937,974, Cl. 290-46.000.

Lakatos, Ferenc: *See—*
Bathory, Judit; Ery nee Nagy, Marta; Gerei, Lajos; Lakatos, Ferenc; Stiller nee Kisteleki, Magdolna; and Vaghy, Tamas, 3,937,694.

Lambert, Alain: *See—*
Flambard, Christian; Lambert, Alain; and Pavon, Miguel Sancho, 3,937,067.

Lambrecht, Richard M.: *See—*
Godel, Julius B.; Guillaume, Marcel; Lambrecht, Richard M.; and Withnell, Ronald, 3,937,966.

Landvogt, Gunther Friedrich, to U.S. Philips Corporation. Transducer comprising strain gauges. 3,937,075, Cl. 73-141.00A.

Lane, Ralph D.: *See—*
Knepper, Ronald W.; Lane, Ralph D.; Ludlow, Peter J.; and Moore, Barry L., 3,938,008.

Lang, Joseph; Meckenstock, Helmut; and Nopper, Hans-Joachim, to Flachglas Aktiengesellschaft Delog-Detag. Apparatus for treating the corners of planar polygonal workpieces. 3,937,381, Cl. 228-6.000.

Lang, Robert A.: *See—*
Sagi, Zsigmond L.; Lang, Robert A.; Scott, Jimmie D.; Weinstein, Berel; and Pickett, Charles G., 3,937,323.

Lange, Henry James; McCunn, Myron Lee; Berk, Martin Adolph; Classen, Peter Jay; and Allen, David Thomas, to Deere & Company. Actuator position control. 3,938,016, Cl. 318-467.000.

Lange, Karl-Heinz, to Balda-Werke. High speed camera shutter. 3,938,168, Cl. 354-247.000.

Langen, Marinus J. M., to H. J. Langen & Sons Ltd. Rotary transfer mechanism. 3,937,458, Cl. 271-95.000.

Langowski, Faustyn C., to Byron Jackson Inc. Guide head for pipe rackers. 3,937,514, Cl. 294-88.000.

Langowski, Faustyn C., to Byron Jackson Inc. Head for pipe rackers. 3,937,515, Cl. 294-88.000.

Lanham Machinery Company, Inc.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 3,937,335.

Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., to Lanham Machinery Company, Inc. Automatic bread pan control system. 3,937,335, Cl. 214-6.0DS.

Lanham, William E., Jr.: *See—*
Lanham, William E.; Lanham, William E., Jr.; and Miller, Gene C., 3,937,335.

Lapie, Jean: *See—*
Berger, Roger; Estienne, Claude; and Lapie, Jean, 3,938,071.

Larocque, Walter. Animal trap. 3,936,973, Cl. 43-81.000.

Larson, George T.; and Hartmann, Richard, Jr., to Thermatool Corporation. Method and apparatus for manufacturing welded metal tubes of finite length. 3,937,914, Cl. 219-67.000.

Larson, Richard R., to Hercules Incorporated. Firing device, explosive charge, method, and system, for seismic exploration. 3,937,296, Cl. 181-118.000.

Lawes, Norman Edward, to British Visqueen Limited. Vented bags. 3,937,395, Cl. 229-62.500.

Lawrence, Frederick J., to Stewart, Keith B.; and Shea, Peter. Sorting machine. 3,937,459, Cl. 271-173.000.

Lawrence Peska Associates, Inc.: *See—*
Critelli, Frank, 3,937,418.
Dempsey, Edward, 3,937,505.
Hufnagel, Frank W., 3,937,509.
Miceli, Nicholas M., 3,936,988.
Warner, Glenfield, 3,938,123.

Lawson, Gustaf Rudolph, to AMP Incorporated. Electrical terminals for flat wire. 3,937,403, Cl. 339-97.00C.

Le Bouchage Mecanique: *See—*
Deix, Jean, 3,936,991.

Leader Denshi Kabushikikaisha: *See—*
Shimizu, Kazuyoshi, 3,938,003.

Lear Siegler, Inc.: *See—*
Knapp, Ralph E., 3,936,947.

Lechner, Robert J., to Honeywell Information Systems Inc. Sequentially encoded data structures that support bidirectional scanning. 3,938,105, Cl. 340-172.500.

Lectromelt Corporation: *See—*
Wynne, Peter J., 3,937,867.

Lee-Kemp, Kenneth William. Connector portion having releasable fastening means. 3,937,547, Cl. 339-74.00R.

Lee, Lloyd: *See—*
Farha, Bahia Rashid; and Lee, Lloyd, 3,937,850.

Lee, Poy. Sure grip winter tire traction device. 3,937,262, Cl. 152-179.000.

Leeds & Northrup Company: *See—*
Clack, Peter J.; and Moreland, George R., 3,937,615.

Leheu, Jacques, to Commissariat a l'Energie Atomique. Diagrid for supporting a nuclear reactor core. 3,937,653, Cl. 176-61.000.

Lehnhoff, Richard N.: *See—*
Staker, William C.; and Lehnhoff, Richard N., 3,938,022.

Leiba, Eugene: *See—*
Garcia, Jean; Hareng, Michel; and Leiba, Eugene, 3,938,140.

Leidich, Arthur John, to RCA Corporation. Transistor amplifier. 3,938,054, Cl. 330-30.00D.

Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. 6-Substituted 1-phenazinol 5,10-dioxide derivatives. 3,937,707, Cl. 260-267.000.

Leiste, Hans Peter: *See—*
Alwes, Dieter; Eckardt, Helmut; Leiste, Hans Peter; and Melcher, Robert Albert, 3,937,447.

Lendi, Ulrich, to Mageba S.A. Compressing refuse. 3,937,139, Cl. 100-215.000.

Lentz, Carl A., to General Motors Corporation. Downshift inhibitor for a powershift transmission. 3,937,107, Cl. 74-861.000.

Leonard, Verna M. Inversion sliderule. 3,937,118, Cl. 84-471.0SR.

Leowald, Karl-Friedrich: *See—*
Hoffmann, Manfred; Schenk, Jakob; and Leowald, Karl-Friedrich, 3,938,026.

Le Pabic, Jean Pierre, to International Standard Electric Corporation. Fault detection process and system for a time-division switching network. 3,937,935, Cl. 235-153.0AK.

Let-R-Edge of Canada, Ltd.: *See—*
Minogue, Robert W.; and Troyer, Lloyd E., 3,937,384.

Levasseur, Georges; and Garconnat, Michel, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Frequency summing device. 3,938,061, Cl. 332-45.000.

Lever Brothers Company: *See—*
Mathur, Girish Prasad; Menon, Kuruvakkat Kochu Govind; and Varadarajan, Srinivasan, 3,937,810.

Levy, Jerome F.: *See—*
Lewis, Sheldon N.; Levy, Jerome F.; and Horton, Napoleon L., 3,937,716.

Lew, Hyok Sang. Exerciser for aerial calisthenics. 3,937,461, Cl. 272-60.00R.

Lew, Hyok Sang. Coupled chopsticks. 3,937,510, Cl. 294-16.000.

Lewin, Nathan; Fries, James E.; and Richards, C. Steven, to Bio-Rad Laboratories. Radioassay of vitamin B-12 employing bentonite. 3,937,799, Cl. 424-1.000.

Lewis, Bernard L.; and Olin, Irwin D., to United States of America, Navy. Sidelobe canceller system. 3,938,153, Cl. 343-100.0LE.

Lewis, Bernard L., to United States of America, Navy. Modified sidelobe canceller system. 3,938,154, Cl. 343-100.0LE.

Lewis, David O.; Miller, Thomas H.; and Schmitt, Steven A., to International Business Machines Corporation. Computer system with post execution I/O emulation. 3,938,101, Cl. 340-172.500.

Lewis, George E.; and Peterman, Charles P., to Hydril Company. Mud gas content sampling device. 3,937,060, Cl. 73-19.000.

Lewis, Gilbert W.: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Osher, Jules V.; Lewis, Gilbert W.; Silver, Robert H.; and Duran, Edward N., 3,937,212.

Lewis, Sheldon N.; Levy, Jerome F.; and Horton, Napoleon L., to Rohm and Haas Company. Oxazolidine derivatives. 3,937,716, Cl. 260-307.0FA.

Leybold-Heraeus-GmbH & Co.: *See—*
Schillalies, Helmut; and Barz, Alfred, 3,937,957.

Lichtblau, George Jay. Antenna apparatus for an electronic security system. 3,938,044, Cl. 325-22.000.

Liedman, Stanley G.: *See—*
Campbell, Glenn M.; and Liedman, Stanley G., 3,937,848.

Liegel, Reinald D.: *See—*
Geis, Warren P.; and Liegel, Reinald D., 3,937,339.

Lilja, Duane F. Multiple fluid dispensing apparatus. 3,937,253, Cl. 137-625.180.

Lim, Franklin: *See—*
Sodickson, Lester A.; and Lim, Franklin, 3,937,614.

Lin, Leroy C. T.: *See—*
Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., 3,937,753.
Hahn, Maneung; Lin, Leroy C. T.; and Tung, William C. T., 3,937,755.

Lincoln Manufacturing Company, Inc.: *See—*
Clymer, Joseph D., deceased, 3,937,095.

Linde Aktiengesellschaft: *See—*
Becker, Rudolf; and Brautigam, Max, 3,937,353.

Lindem, Thomas J.; and Van Roojen, Jan, to Ingersoll Milling Machine Company, The. Adjustable cutter tooth mounting. 3,937,587, Cl. 408-181.000.

Lindlar, Herbert: *See—*
Brenner, Wolf; Lindlar, Herbert; and Hinderling, Rudolf, 3,937,740.

Lindner, Ernest: *See—*
Stache, Ulrich; Fritsch, Werner; Haede, Werner; and Lindner, Ernest, 3,937,697.

Lindqvist, Rolf Erik. Method and means for obtaining staples or the like. 3,937,006, Cl. 59-76.000.

Lindsay, Ian. Float connection assemblies for multi-hulled boats. 3,937,166, Cl. 114-123.000.

Linear Systems Incorporated: *See—*
Snell, Stephen Charles, 3,937,972.

Linke, Josef Maria: *See—*
Corbett, John McCreath; and Linke, Josef Maria, 3,938,050.

Linnepe, Harald, to Vereinigte Deutsche Metallwerke AG. Method of and apparatus for grinding wire. 3,936,980, Cl. 51-73.00R.

Lippmann, Wilbur, to American Home Products Corporation. Reducing the incidence of gastrointestinal side effects during the treatment of inflammatory conditions with antiinflammatory drugs. 3,937,801, Cl. 424-10.000.

List, Ralph W.; Irwin, Malcolm F.; and Stanley, Robert K., to Textured Yarn Co., Inc. Strand treatment apparatus. 3,936,918, Cl. 28-59.000.

Little, Arthur J.; and Mayer, William R., to Stewart-Warner Corporation. Buzzer. 3,938,143, Cl. 340-402.000.

Littwin, Arthur K. Tape degausser. 3,938,011, Cl. 317-157.5MR.

Liu, Alexander F.: *See—*
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Loda, Paul P., to H. C. Cook Company, The. Nail clipper. 3,937,234, Cl. 132-75.600.

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Loffler, Karlheinz: *See—*
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Lofmark, Bengt Gustav, to Telefonaktiebolaget L M Ericsson. Apparatus for measuring a signal voltage including a current source with a control input on which said signal appears. 3,938,040, Cl. 324-119.000.

Loge, Hans, to Kaltenbach & Voight. Dental handtool. 3,936,940, Cl. 32-26.000.

Lohninger, Wilhelm J., to United States of America, Army. Helical baffle for the density integrating fuze head. 3,937,145, Cl. 102-73.00R.

Lohse, Friedrich: *See—*
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Longhouse, Richard E., to General Motors Corporation. Ejector fan shroud arrangement. 3,937,192, Cl. 123-41.490.

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Louie, Ming H., to Honeywell Information Systems, Inc. High speed binary comparator. 3,938,087, Cl. 340-146.200.

Louth, Kenneth; and Oldershaw, Reginald William, to Ampex Corporation. Tape pack diameter measurement means and method. 3,938,041, Cl. 324-158.00R.

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Luhdorff, Dieter; Oehlerking, Bernd; Jaworsky, Hugo; Koth, Gerhard; and Simon, Klaus-P., to WABCO Westinghouse GmbH. Control system providing a variable impulse-like brake release and/or reapplication signal for wheel slip control. 3,937,525, Cl. 303-21.00P.
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Mahoney, James D. Method of loading, handling and unloading cargo from a transporting vehicle. 3,937,341, Cl. 214-152.000.
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Mangus, Jack E. Guidance device. 3,938,122, Cl. 340-275.000.
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Martin, Clyde J., to Martin Industries, Inc. Pressure responsive circuit control unit having adjustable, interchangeable actuator components and cam-operated switch. 3,937,912, Cl. 200-82.00C.
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Massa, Frank; and Barrow, Gilbert C., to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of the Stoneleigh Trust. Electroacoustic transducers of the bilaminar flexural vibrating type and method for manufacturing same. 3,937,991, Cl. 310-9.100.
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Matsuo, Jon T., to United States of America, Navy. Multiple strap shock absorber. 3,937,407, Cl. 244-151.00R.
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McKenna, Robert T., to United States of America, General Counsel-Code GP. Automatic character skew and spacing checking network. 3,938,182, Cl. 360-26.000.
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Mercier, Jacques H. Method of molding a pressure vessel locking ring with split rigid reinforcing segments. 3,937,780, Cl. 264-274.000.
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Blethen, William M.; and Milligan, Lee J., 3,937,890.

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Minchenko, George: *See—*
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Minerals Management, Inc.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Benassi, Dominic A., 3,938,125.
Rusch, Thomas W.; and Sievers, Jerry A., 3,937,958.
Throckmorton, James R., 3,937,738.

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Minogue, Robert W.; and Troyer, Lloyd E., to Let-R-Edge of Canada, Ltd. Process for constructing three-dimensional sign character. 3,937,384, Cl. 228-120.000.

Minot, Pierre Jean Marie, to Societe Anonyme de Telecommunications. Telecommunications signal amplifier. 3,938,057, Cl. 330-78.000.

Minter, Elbert J.: *See—*
Caruso, Vincent P.; and Minter, Elbert J., 3,937,055.

Misawa, Toshihiko: *See—*
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Mitani, Yuji; Aito, Yuzo; Yamaguchi, Masahiro; and Nawata, Kiyoshi, to Teijin Ltd. Radical initiator-curable diallyl ester compositions and cured resins obtained therefrom. 3,937,689, Cl. 260-78.5UA.

Mitsubishi Denki Kabushiki Kaisha: *See—*
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Mitsubishi Heavy Industries, Ltd.: *See—*
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Mitsubishi Paper Mills, Ltd.: *See—*
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Mitsui, Tatsuro: *See—*
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Mittenzwei, Hellmut: *See—*
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Miura, Shunji; and Kawamata, Toshio, to Origin Electric Co., Ltd. Process for treatment of semiconductor. 3,938,178, Cl. 357-91.000.

Mo och Domsjo Aktiebolag: *See—*
Joensson, Karl-Erik; and Nordquist, Hakan, 3,937,114.

Mobil Oil Corporation: *See—*
Garwood, William E.; Chen, Nai Yeun; and Lucki, Stanley J., 3,937,791.
Heath, Donald P., 3,937,202.
Nahmias, A. Michael; and Bullard, Edward M., 3,937,762.

Mobility, Inc.: *See—*
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Modine Manufacturing Company: *See—*
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Modini, Gabriele: *See—*
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Mohasco Corporation: *See—*
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Moldenhauer, Kurt: *See—*
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Molenaar, Albert Meijlom; and Veenstra, Melle, to Douwe Egberts Tabaksfabriek-Koffiebranderijen-Theehandel B.V. Coffee filtering. 3,937,134, Cl. 99-295.000.

Molson Companies Limited, The: *See—*
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Molzer, Peter: *See—*
Winkle, Gunther; Schwarzler, Peter; Otto, Peter H.; Molzer, Peter; and Walkner, Christian, 3,937,149.

Monaghan, Stephen R.: *See—*
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Monahan, Michael A.: *See—*
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Monju, Yoshiyuki: *See—*
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Monks, Harry, to Coal Industry (Patents) Limited. Mineral mining equipment. 3,937,151, Cl. 104-172.00R.

Monsanto Company: *See—*
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Montgomery, Billie Jo, executrix: *See—*
Montgomery, Thurman Rex, deceased; and Montgomery, Billie Jo, executrix, 3,937,344.

Montgomery, Thurman Rex, deceased; and by Montgomery, Billie Jo, executrix. Apparatus for transporting and handling large loads of building materials. 3,937,344, Cl. 214-505.000.

Moody, Robert J., to Scott & Williams, Inc. Method and apparatus for knitting terry fabric. 3,937,037, Cl. 66-93.000.

Moon, William T., Jr.: *See—*
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Moore, Barry L.: *See—*
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Moore, Frank D.: *See—*
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Moore, Richard E. Pressure polished extruded polycarbonate sheet. 3,937,863, Cl. 428-410.000.

Moore, William: *See—*
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Moore, William M.: *See—*
Milberger, Lionel J.; Swift, Gilbert; and Moore, William M., 3,937,065.

Moore, William Percy; and Hundtofte, Virgil Anton, to Allied Chemical Corporation. Process for producing decachlorooctahydro-1,3,4-metheno-2H-cyclobuta-(c,d)-pentalen-2-one. 3,937,734, Cl. 260-586.00R.

Moreau, Jerry P.: *See—*
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Moreland, George R.: *See—*
Clack, Peter J.; and Moreland, George R., 3,937,615.

Morex, Inc.: *See—*
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Morgan, Robert F., Jr.: *See—*
Fox, Robert H.; Henning, Robert J.; and Morgan, Robert F., Jr., 3,937,438.

Morheng, Marcel J., to Goodyear Tire & Rubber Company, The. Mold for forming tires. 3,937,606, Cl. 425-28.00D.

Morioka, Minoru; and Katagiri, Nagatoshi, to Honda Giken Kogyo Kabushiki Kaisha. Motorized two-wheeled vehicle with novel disposition of fuel tank and parts housing. 3,937,484, Cl. 180-33.00R.

Morita, Katsuyuki: *See—*
Kanetake, Norio; Maruyama, Ikuo; and Morita, Katsuyuki, 3,937,794.

Morizur, Jean-Yves, to Societe Anonyme: Poclain. Device for guiding the relative displacement of two bodies. 3,937,540, Cl. 308-222.000.

Moroff, Helmut: *See—*
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Morokawa, Shigeru: *See—*
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Morokhovsky, Alexei Sergeevich: *See—*
Fix, Izrail Grigorievich; Morokhovsky, Alexei Sergeevich; Gammerman, Mikhail Yakovlevich; Khaitin, Benno Abramovich; Laar, Tynis Eduardovich; and Mezhburd, Volf Iolevich, 3,937,080.

Moroney, James E.: *See—*
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Morrin, Thomas Harvey; and Van Voorhis, David Curtis, to International Business Machines Corporation. Method and apparatus for accessing horizontal sequences and rectangular sub-arrays from an array stored in a modified word organized random access memory system. 3,938,102, Cl. 340-172.500.

Morris, Thomas M.: *See—*
Hoexter, Rolf; and Morris, Thomas M., 3,937,052.

Morrison, Richard A.; and Johnston, Cecil W. Method and apparatus for making a focused shield. 3,937,971, Cl. 250-515.000.

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Mortier, Frans Henri; Dekeyser, Willy Rene Evarist; and Sadler, Loren Gage, to Sperry Rand Corporation. Means for converting a pickup on a crop treating machine between field and transport positions. 3,936,994, Cl. 56-228.000.
Moser, Markus: *See—*
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Moser, Rabin; and Ruhland, John G., to Xerox Corporation. Roll contact fuser. 3,937,637, Cl. 148-6.000.
Mosstype Corporation: *See—*
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Motoren- und Turbinen-Union Munchen GmbH: *See—*
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Muehllehner, Gerd, to G. D. Searle & Co. Scintillation camera with second order resolution. 3,937,964, Cl. 250-366.000.
Muehllehner, Gerd, to G. D. Searle & Co. Gamma ray camera system with corrugated collimators. 3,937,969, Cl. 250-505.000.
Mueller, Clifford E.: *See—*
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Mukaiyama, Teruaki; Ueki, Masaaki; Matsueda, Rei; and Maruyama, Hiroshi, to Sankyo Company Limited. Process for the preparation of a carboxylic acid ester. 3,937,718, Cl. 260-326.400.
Muller, Artur, to Industrie Werke Karlsruhe Augsburg AG. Electric drive for fiber or thread winding machines and method of operating winding machines. 3,937,409, Cl. 242-18.00R.
Muller, Harold H.: *See—*
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Munse, Robert A., to Microdot Inc. Drill screw. 3,937,120, Cl. 85-47.000.
Murakami, Tomomi; and Kawashima, Hideyuki, to Citizen Watch Co., Ltd. Monitoring system for digital electronic timepiece. 3,937,049, Cl. 73-6.000.
Murari, Bruno: *See—*
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Muslinkin, Abdurakhim Abdurakhimovich: *See—*
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Myers, Oscar, to Bell Telephone Laboratories, Incorporated. Signal transmission with secrecy. 3,937,888, Cl. 179-1.50C.
Nachfolger Hense & Pleines GmbH & Co.: *See—*
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Nagakura, Masayuki. Long distance telephone call limiting device. 3,937,900, Cl. 179-90.00D.
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Nahmias, A. Michael; and Bullard, Edward M., to Mobil Oil Corporation. Heat sealable thermoplastic film forming compositions. 3,937,762, Cl. 260-889.000.
Nakagawa, Ryuichi; Yoshimatsu, Shiro; Fukuzawa, Akira; Sato, Akira; Mitsui, Tatsuro; Ueda, Takuya; and Ozaki, Tsuyosho, to National Research Institute for Metals. Induction melting furnace. 3,937,868, Cl. 13-26.000.
Nakai, Akira: *See—*
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Nakajima, Hitoshi; Nomura, Fujio; and Izawa, Shinichi, to Asahi Kasei Kogyo Kabushiki Kaisha. Catalyst for methylation of phenols. 3,937,669, Cl. 252-432.000.
Nakajima, Toshio, to Nippon Electric Co., Inc. Gate circuit. 3,937,982, Cl. 307-205.000.
Nakajima, Toshitaka, to Fuji Electric Co., Ltd. Brushless d-c motor. 3,938,014, Cl. 318-138.000.
Nakanishi, Kenzo; and Hanasaka, Yasuaki, to Bridgestone Tire Company, Ltd. Alarm device for continually indicating the state of air pressure in a plurality of tires. 3,938,077, Cl. 340-58.000.
Namae, Takao, to Nihon Denshi Kabushiki Kaisha. Method and apparatus for automatically focusing. 3,937,959, Cl. 250-311.000.
Nanny, Walter C. Check valve. 3,937,240, Cl. 137-527.800.
Narayan, Venkat: *See—*
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Narwid, Bernard V.; and Fellers, Martin W. Sheet material feed apparatus. 3,937,379, Cl. 226-150.000.
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Naslund, Ulf Vilhelm; and Skog, Egil, to Husqvarna AB. Automatic brake actuator for a chain saw. 3,937,306, Cl. 188-166.000.
Nasr, Ibrahim Abdelrahim Mohamed. Wheelchair. 3,937,490, Cl. 280-242.0WC.
Nathanson, Albert. Disk switch light. 3,937,947, Cl. 240-10.100.
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Nemecz, Erno; Ujhidy, Aurel; Polinszky, Karoly; Szepvolgyi, Janos; Borlai, Oszkar; Kapolyi, Laszlo; and Szekely, Tamas, to Toth Aluminum Corporation. Production of aluminum chloride from raw materials containing coal. 3,937,786, Cl. 423-136.000.
Nerenberg, Robert W., to Interstate Folding Box Company, The. Tubular hinged lid carton. 3,937,393, Cl. 229-51.0TC.
Netschert, Carl O. Handle for paper bag. 3,937,394, Cl. 229-54.00R.
Neuhof, Jacob, to General Signal Corporation. Snap-on housing adapted for panel mounting of transducer. 3,938,141, Cl. 340-384.00R.
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Newman, Douglas A., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Film inking system. 3,937,178, Cl. 118-109.000.
Ngo, Peter Dinh-Tuan; and Ninke, William Herbert, to Bell Telephone Laboratories, Incorporated. Plasma panel light pen tracking using adaptive tracking scan. 3,938,137, Cl. 340-324.00M.
Nicholson, David W.; and Diepering, Gerrit J., to Eli Lilly and Company. Tablet coating apparatus with unloader. 3,937,176, Cl. 118-19.000.
Nicholson, James, to Imperial Chemical Industries Limited. Apparatus for constricting or closing conduits. 3,937,050, Cl. 72-453.000.
Nickerson, John T. R.; and Darack, John R., to Dirigo Corporation. Compositions for safe extension of storage life of foods. 3,937,814, Cl. 424-93.000.
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Nisolle, Rene, to Solvay & Cie. Device for measuring the condensation temperature of a gas or a vapor. 3,937,059, Cl. 73-17.00A.
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Oberstein, Nathan. Bio-disposable bag-type liner for bedpans and the like. 3,936,890, Cl. 4-112.000.
O'Bryan, Henry Miles, Jr.; Pluorde, James Kevin; and Thomson, John, Jr., to Bell Telephone Laboratories, Incorporated. Devices using low loss dielectric material. 3,938,064, Cl. 333-73.00S.
Oce-van der Grinten N.V.: *See—*
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Ohnishi, Masahiro; Okamoto, Yoshihiko; and Ohta, Takahiro, to Fuji Photo Film Co., Ltd. Device for thermally recording a cathode-ray tube image. 3,938,164, Cl. 346-110.00R.
Ohta, Keizou, to Nippon Electric Company, Limited. Telephone hook switch comprising separately operable contact groups. 3,937,906, Cl. 179-164.000.
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Rhodes, Charles F., Jr., to Sun Oil Company (Delaware). Zeroing circuit. 3,937,062, Cl. 73-27.00R.

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Ridgely, John N. Process and system for removing tritium. 3,937,649, Cl. 176-19.00R.
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Riedmueller, Eberhard; and Klawitter, Horst, to Spieth, Ernst K. Spring type clay pigeon projecting device. 3,937,203, Cl. 124-8.000.
Riegel, Herbert, to Lummus Company, The. Vinyl chloride process. 3,937,744, Cl. 260-656.00R.
Riess, Joseph A., to Quote, Inc. Coin operated terminal. 3,938,093, Cl. 340-152.00R.
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Dodge, Thomas W.; Rinkleib, Helfried O.; and Rueger, William J., 3,937,325.
Ripley, Lionel George; and Grimsdale, Richard Lawrence, to National Research Development Corporation. Keyboard and switches for keyboards. 3,937,952, Cl. 250-227.000.
Rising, Bradley D., to Eastman Kodak Company. Exposure control apparatus for photographic printers. 3,937,573, Cl. 355-83.000.
Risse, Jean-Claude; and Hardegger, Bruno, to Tesa S.A. Measuring instrument. 3,937,090, Cl. 74-55.000.
Rittelmann, P. Richard: *See—*
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Roberts, Marion Winifred, to John D. Hollingsworth on Wheels, Inc. Metallic flat clothing. 3,936,911, Cl. 19-113.000.
Roberts, Raymond L. Page holder and book support. 3,937,435, Cl. 248-464.000.
Robertshaw Controls Company: *See—*
Bible, Harley V.; and Moon, William T., Jr., 3,937,244.
Genbauffe, Francis S., 3,936,919.
Tyler, Hugh J.; and Wolfe, Denis G., 3,937,439.
Robertson, Paul E. Beam carriage type automatic arc welding apparatus with welding head tracking mechanism. 3,937,918, Cl. 219-125.00R.
Robicon Corporation: *See—*
Blackmond, Ronald C., 3,938,031.
Robinson, Alfred Henry, to International Publishing Corporation Limited. Code communication. 3,937,871, Cl. 178-6.000.
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Rockwell International Corporation: *See—*
Kalous, Leo R., 3,937,352.
Rodel, Egon; and Neuhoff, Volker, to Heraeus-Christ GmbH; and Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Analytic cell for use in high-speed ultra centrifuges. 3,937,581, Cl. 356-246.000.
Rodormer, George W., to Reliable Electric Company. Post-tensioning anchors assembled in combination with a spacer strip. 3,937,607, Cl. 425-111.000.
Roeder, George K. Burglar alarm. 3,937,891, Cl. 179-5.00R.
Rogier, Edgar R.; Jevne, Allan H.; and Schwebke, Gerald L., to General Mills Chemicals, Inc. Amidification products of C_{18} dicarboxylic acid and cyclical diamines. 3,937,687, Cl. 260-78.00R.
Rogier, Edgar R.; Jevne, Allan H.; and Schwebke, Gerald L., to General Mills Chemicals, Inc. Copolyamides from an isomeric mixture of heptadecane dicarboxylic acid. 3,937,688, Cl. 260-78.00R.
Rohm GmbH: *See—*
Huebner, Klaus; Neumann, Helmut; Ottofrickenstein, Hans; Morroff, Helmut; and Suetterlin, Norbert, 3,937,648.
Rohm and Haas Company: *See—*
Lewis, Sheldon N.; Levy, Jerome F.; and Horton, Napoleon L., 3,937,716.
Roland, Bruce, to Rolson & Co. Tennis stroke training device. 3,937,465, Cl. 273-29.00A.
Rollinson, John E.: *See—*
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Rolls-Royce Motors Limited: *See—*
Sharples, John, 3,937,602.
Rolson & Co.: *See—*
Roland, Bruce, 3,937,465.
Romanski, Andrzej Antoni Florian; Brookes, Derek John; Smith, Anthony; and Markham, Harry, to British Steel Corporation (Chemicals) Limited. Production of hard titania. 3,937,797, Cl. 423-610.000.
Romer, Werner; and Orthey, Rolf, to Busch-Jaeger Ludenscheider Metallwerk GmbH. Process for the bright annealing and recrystallization of non-ferrous metals. 3,937,639, Cl. 148-13.200.
Rongus, Leo P.: *See—*
Davis, Harry J.; and Rongus, Leo P., 3,937,146.
Rooijmans, Coenraad Jozef Maria; Druyvesteyn, Willem Frederik; and Dorleijn, Jan Willem Frederik, to U.S. Philips Corporation. Magnetic device for producing domains. 3,938,111, Cl. 340-174.0TF.
Ropers, Johann: *See—*
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Rosenberg, Edgar N. Launch and recovery vessel. 3,937,163, Cl. 114-43.5UC.
Rosenberg, Lawrence: *See—*
Anderson, Warren A.; Rosenberg, Lawrence; and Damon, Melvin H., Jr., 3,936,954.
Rosenberg, Phillip I.; and Keces, Mervyn L. Gumball bank dispensing mechanism. 3,937,314, Cl. 194-63.000.
Rosenberger, Gerhard: *See—*
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Rosicky, Jan, to Alpha Chemicals (Australia) Pty. Limited. Device for the determination of chlorine in the water of swimming pools. 3,937,613, Cl. 23-253.0TP.
Ross, Joseph Kenneth. Apparatus for installing coil springs. 3,936,921, Cl. 29-227.000.
Ross, Milton Dean: *See—*
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Rouverol, William S. High torque gearing. 3,937,098, Cl. 74-462.000.
Rowland, Bobby A.: *See—*
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Rueger, William J.: *See—*
Dodge, Thomas W.; Rinkleib, Helfried O.; and Rueger, William J., 3,937,325.
Ruffner, Heinz E.; and Donner, Meinrad, to Maag Gear-Wheel & Machine Co., Ltd. Gear tester for pitch measuring. 3,936,946, Cl. 33-179.50R.
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Runft, Arthur J.; and Meyer, Walter E., to Kelley Company, Inc. Fluid activated load operator. 3,936,977, Cl. 49-137.000.
Runnells, Robert R., to MDT Chemical Company. Ultrasonic cleaning device. 3,937,236, Cl. 134-184.000.
Ruof, Edgar J., to Goodyear Aerospace Corporation. Single valve braking system having anti-skid control. 3,937,526, Cl. 303-21.00A.
Rusch, Thomas W.; and Sievers, Jerry A., to Minnesota Mining and Manufacturing Company. Charged particle beam apparatus. 3,937,958, Cl. 250-307.000.
Rutner, Herman: *See—*
Gutcho, Sidney; Rapun, Raul; Rutner, Herman; and Charig, Andrew, 3,937,698.
Ryder, Leonard B. Method and apparatus for molding materials. 3,937,609, Cl. 425-210.000.
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Sabatino, Daniel D.; and Wilkens, Henry W., to Flowtron Industries Inc. Temperature-compensating liquid meter. 3,937,083, Cl. 73-224.000.

Sable, Harvey J.: *See—*
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Saggers, David Thomas: *See—*
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Sagi, Zsigmond L.; Lang, Robert A.; Scott, Jimmie D.; Weinstein, Berel; and Pickett, Charles G., to Bio-Medical Sciences, Inc. Protective frangible dispensing enclosure for article. 3,937,323, Cl. 206-306.000.

St. Clair, Theodore A.; Weltz, Richard K.; and Yaglowski, Henry T., to Textron Inc. Methods and apparatus for proving gas meters. 3,937,048, Cl. 73-3.000.

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Swisher, Robert Allen, 3,937,392.

Saito, Takahiko; Iwase, Koichi; and Shimada, Shojiro, to Sony Corporation. Power supply switching circuit for combined audio system. 3,937,886, Cl. 179-1.0SW.

Sakai, Masaaki, to Sony Corporation. Reproducing apparatus for a disc type record medium. 3,937,476, Cl. 274-39.00A.

Sakamaki, Hisashi: *See—*
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Salient Electronics, Inc.: *See—*
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Salmijak, Erich; and Goransson, Eric, to Aktiebolaget Demektor. Liquid dosage device having rotary feeler. 3,937,362, Cl. 222-20.000.

Salsbury, Phillip J.; and Perlegos, George, to Intel Corporation. Erasable programmable read-only memory. 3,938,108, Cl. 340-173.00R.

Salvadore, Eugene A.; and Zimmerman, Paul J., to Crucible Inc. Mold powder composition and method for continuously casting employing the same. 3,937,269, Cl. 164-73.000.

Samour, Carlos M.; and Vida, Julius A., to Kendall Company, The. 5-Pivaloyloxy-5-(1-phenylethyl) barbituric acid, analgetic composition and method based thereon. 3,937,830, Cl. 424-254.000.

Sandoz, Inc.: *See—*
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Sanford, Gary G., to Ball Brothers Research Corporation. Microstrip antenna structure. 3,938,161, Cl. 343-829.000.

Sanford, Robert Fincher: *See—*
Long, Donald Charles; Hartsough, Albert Charles; and Sanford, Robert Fincher, 3,938,010.

Sankyo Company Limited: *See—*
Mukaiyama, Teruaki; Ueki, Masaaki; Matsueda, Rei; and Maruyama, Hiroshi, 3,937,718.

Sano, Tadashi, to Kabushiki Kaisha Seikosha. Semiconductor integrated circuit and method of manufacture. 3,938,174, Cl. 357-23.000.

Sansui Electric Co., Ltd.: *See—*
Kato, Tomomi, 3,937,422.

Sansyu Sangyo Co., Ltd.: *See—*
Azumano, Hideyuki, 3,937,227.

Santa Martha Bay Shipping and Trading Co., Ltd.: *See—*
Pratolongo, Modesto, 3,937,135.

Sanyo Chemical Industries, Ltd.: *See—*
Fujimoto, Takehiko; Kakehi, Tetsuo; and Susaki, Kazumichi, 3,937,802.

Saporito, James; and Gaertner, Wolfgang W., to United States of America, Air Force. Equipment self-repair by adaptive multifunction modules. 3,937,936, Cl. 235-153.0AE.

Sarantakis, Dmitrios, to American Home Products Corporation. P-Glu-Trp-Ser-Tyr-D-Lys-Leu-Arg-Pro-Gly-NH_2 and intermediates. 3,937,695, Cl. 260-112.5LH.

Sargunar, John Ebenezer, to Burroughs Corporation. Magnetic transducer head having an integral magnetic shield and wear indicator. 3,938,193, Cl. 360-137.000.

Sarkes Tarzian, Inc.: *See—*
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Sasaki, Takehiko; Yamamoto, Keizo; and Fukuda, Hiroaki, to Sharp Kabushiki Kaisha. Embossed card reader. 3,937,928, Cl. 235-61.11E.

Sato, Akira: *See—*
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Sato, Takero;: *See—*
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Sato, Toshiyuki. Device for connecting telescoping pipes. 3,937,500, Cl. 285-323.000.

Sauerwein, William Douglas, to Black and Decker Manufacturing Company, The. Rotary driving tool having a torque responsive clutch. 3,937,036, Cl. 64-29.000.

Saunders Archery Co.: *See—*
Saunders, Charles A., 3,937,205.

Saunders, Charles A., to Saunders Archery Co. Bow string finger guard. 3,937,205, Cl. 124-30.00A.

Saunders, Frank L., to Dow Chemical Company, The. Hardness tester. 3,937,069, Cl. 73-81.000.

Saunders, William T., to National Steel Corporation. Structure and method facilitating stripping of seamless can body from ironing mandrel. 3,937,047, Cl. 72-344.000.

Sawert, Walter, to Continental Can Company, Inc. High speed room temperature seam bonding of metal sheets. 3,937,383, Cl. 228-115.000.

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Schabert, Hans-Peter; and Ropers, Johann, to Siemens Aktiengesellschaft. Nuclear reactor facility. 3,937,651, Cl. 176-38.000.

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Schaeffler, Georg: *See—*
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Schafer, Hugo; and Janousch, Erwin, to Hoechst Aktiengesellschaft. Use of thioindigo for obtaining fluorescent dyeings in polyvinyl chloride. 3,937,666, Cl. 252-301.20R.

Schaffer, Kenneth L.: *See—*
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Schenk, Jakob: *See—*
Hoffmann, Manfred; Schenk, Jakob; and Leowald, Karl-Friedrich, 3,938,026.

Scherer, Otto; Horlein, Gerhard; and Schonowsky, Hubert, to Hoechst Aktiengesellschaft. Urea derivatives and their use as herbicides. 3,937,726, Cl. 260-553.00A.

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Schick, Andre. Product display carton. 3,937,326, Cl. 206-465.000.

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Schiffer, Heinz, to Amcel Europe, S.A. Method and apparatus for production of false twist textured composite yarn. 3,936,996, Cl. 57-34.0HS.

Schillalies, Helmut; and Barz, Alfred, to Leybold-Heraeus-GmbH & Co. Apparatus for determining the energy of charged particles. 3,937,957, Cl. 250-305.000.

Schilling Chilling Manufacturing Corporation: *See—*
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Schilling, John E., to Schilling Chilling Manufacturing Corporation. Gauge system for measuring air flow in ducts. 3,937,082, Cl. 73-208.000.

Schimpfle, Jorg, to Krauss-Maffei Aktiengesellschaft. Apparatus for freeze-drying. 3,936,952, Cl. 34-92.000.

Schlenker, Vesper A., to United States of America, Army. Magnetic disc coder-decoder. 3,937,880, Cl. 178-22.000.

Schlueter, Heinz, to Wasag-Chemie GmbH. Device for point ignition of a charge. 3,937,143, Cl. 102-28.00M.

Schmid, Rolf; Lohse, Friedrich; Fatzer, Willy; and Batzer, Hans, to Ciba-Geigy Corporation. Curable compositions based on epoxide resins and polyester-tricarboxylic acids or -tetracarboxylic acids. 3,937,751, Cl. 260-835.000.

Schmider, Paul, to Beckman Instruments G.m.b.H. Illumination system for an atomic absorption spectral photometer. 3,937,576, Cl. 356-74.000.

Schmidt, Delf: *See—*
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Schmidt, Jacob, Jr.: *See—*
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Schmidt, Jacob, Sr.; and Schmidt, Jacob, Jr. Sanitary rail structure for food products vessel. 3,937,356, Cl. 220-73.000.

Schmidt, Jean, to Karl Suss KG. Process for the double-sided exposure of a semiconductor or substrate plates, especially wafers, as well as apparatus for the purpose of parallel and rotational alignment of such a plate. 3,937,579, Cl. 356-144.000.

Schmidt, Karl-Heinz: *See—*
Schulz, Horst; Hild, Erich; Steuer, Werner; Schmidt, Karl-Heinz; Eisend, Ewald; Loffler, Karlheinz; Flosser, Josef; and Kessler, Reinhard, 3,937,309.

Schmidt, Richard F., to United States of America, General Counsel-Code GP. Variable beamwidth antenna. 3,938,162, Cl. 343-840.000.

Schmidt, Werner: *See—*
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Schmiterlow, Fredrik: *See—*
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Schmitt, Gerhard; and Knierim, Gerhard, to Varta Batterie Aktiengesellschaft. Charging of storage batteries. 3,938,019, Cl. 320-21.000.

Schmitt, Steven A.: *See—*
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Schneider, Helmut L., to Molson Companies Limited, The. Leak detection device. 3,938,116, Cl. 340-242.000.

Schneider, William C., to United States of America, General Counsel-Code GP. Auger attachment method for insulation. 3,936,927, Cl. 29-526.000.

Schneider, William S. Valve for vented package. 3,937,396, Cl. 229-62.500.

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Schonowsky, Hubert: *See—*
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Schoolden, Raymond. Mobile chair for paraplegics. 3,937,519, Cl. 297-347.000.

Schots, Klass, to Hopfma Anstalt. Valve mechanism. 3,937,246, Cl. 137-322.000.

Schott, Dan J., to Beckman Instruments, Inc. Reduction of blanking requirements in a gaseous glow discharge display tube having a plurality of digits. 3,937,999, Cl. 315-169.0TV.

Schoumaker, Henry Rene: *See—*
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Schowe, Lester F., Jr., to General Electric Company. Receiver for bipolar coded data with bit time interval detection used as the data validation discriminant. 3,938,082, Cl. 340-146.10D.

Schramm, Georg, to Siemens Aktiengesellschaft. Electrode adapted for implantation. 3,937,225, Cl. 128-418.000.

Schramm, George William: *See—*
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Schroder, Rolf: *See—*
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Schroder, Wolfgang, to International Standard Electric Corporation. Ultrasonic transmitter for the remote control of radio and television receivers. 3,938,142, Cl. 340-388.000.

Schroeck, Calvin William, to Lubrizol Corporation, The. Method for the preparation of sulfonic acid esters from free sulfonic acids. 3,937,721, Cl. 260-456.00A.

Schroer, Richard Allen: *See—*
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Schubert, Keith E., to Pitney-Bowes, Inc. Double break-off screw. 3,937,121, Cl. 85-61.000.

Schueler, Marlin A., to American/Durein Company. Chopper for margins of multi-folded paper. 3,937,377, Cl. 225-94.000.

Schulte-Elte, Karl-Heinrich, to Firmenich S.A. Cycloaliphatic compounds as odour- and taste-modifying agents. 3,937,723, Cl. 260-488.00R.

Schulz, Horst; Hild, Erich; Steuer, Werner; Schmidt, Karl-Heinz; Eisend, Ewald; Loffler, Karlheinz; Flosser, Josef; and Kessler, Reinhard, to Fichtel & Sachs AG. Multiple speed hub for a bicycle and like vehicle. 3,937,309, Cl. 192-6.00A.

Schwartz, Hermann, to Siegfried Peyer. Electro-mechanical thread supervisory apparatus. 3,938,119, Cl. 340-259.000.

Schwarzer, Johann; Meins, Peter; and Voparil, Kurt, to Henkel & Cie GmbH. Dialkylphosphonoacetylurea compounds and processes for preparation and use for flameproofing. 3,937,612, Cl. 8-186.000.

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Schwebel, Adolf, to Mabeg Maschinenbau GmbH; and Nachfolger Hense & Pleines GmbH & Co. Sheet feeder apparatus. 3,937,457, Cl. 271-92.000.

Schwebke, Gerald L.: *See—*
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Rogier, Edgar R.; Jevne, Allan H.; and Schwebke, Gerald L., 3,937,688.

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Scionics Corporation, The: *See—*
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Scott, Kenneth Clive: *See—*
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Scott, Ray A.: *See—*
Mikovits, John L.; Strang, Elmer J.; Scott, Ray A.; and Sorenson, Billy L., 3,937,264.

Scott & Williams, Inc.: *See—*
Moody, Robert J., 3,937,037.

Seaboard Coast Line Railroad Company: *See—*
McLean, Leonard A., 3,937,330.

Seaborn, John K. Multihull tugboat. 3,937,171, Cl. 114-235.00R.

Seals, Harold, to Kline, Larry Harold. Housing for an impeller. 3,937,369, Cl. 222-410.000.

Seidler, Helmut G.; and Walker, James T., to Aeronutronic Ford Corporation. Printed wiring circuit guard ring. 3,937,980, Cl. 307-120.000.

Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi, 3,938,169.

Seilly, Alec Harry; Scott, Kenneth Clive; and Driver, Kenneth Leslie, to C.A.V. Limited. D. C. Motor control system effecting changes in the connections of the armature and variations in current flow through the field. 3,938,013, Cl. 318-92.000.

Sekiya, Fukuo: *See—*
Natori, Minoru; Nomura, Yasushi; Sekiya, Fukuo; Morokawa, Shigeru; and Nakai, Akira, 3,937,004.

Selective Educational Equipment, Inc.: *See—*
Harrison, Burton H., 3,937,085.

Selig, William L.: *See—*
Hulme, Edwin C., 3,938,080.

Seilstedt, John H.; and Klaubert, Dieter H., to American Home Products Corporation. (4-Oxo-4H-1-benzopyran-2-yl)-oxamic acid, salts and esters anti-allergic agents. 3,937,719, Cl. 260-345.200.

Semkina, Novella Vladimirovna; Evdokimova, Zinaida Ulyanovna; Assanovich, Konstantin Sergeevich; and Rozlovsky, Anatoly Alexandrovich. Composition for preparing solid electrolytes and the formulation of a solid electrolyte. 3,937,670, Cl. 252-519.000.

Semmlow, John Leonard; and Stark, Lawrence, to Direct Access Corporation. Storage and retrieval system for magnetic tape cassettes. 3,938,190, Cl. 360-72.000.

Serita, Hajime: *See—*
Horikawa, Hideichi; Katayama, Shitomi; Serita, Hajime; and Masuda, Noboru, 3,937,764.

Seto, John Y. W.: *See—*
Jaffe, James M.; and Seto, John Y. W., 3,938,175.

Sevenet, Thierry; Thal, Claude; Husson, Henri Philippe; and Potier, Pierre, to Agence Nationale de Valorisation de la Recherche (ANVAR). Vincamine derivatives and process for the preparation of vincamine and derivatives thereof. 3,937,709, Cl. 260-293.530.

Seyd, Gunter: *See—*
Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, 3,937,522.

Seydl, Wolfgang; and Strickle, Erich, to BASF Aktiengesellschaft. Molding compositions of polybutylene terephthalate and olefin polymer. 3,937,757, Cl. 260-873.000.

SGS-ATES Componenti Elettronici SpA: *See—*
Menniti, Pietro; and Murari, Bruno, 3,938,053.

Shaak, Ray Ned: *See—*
Brummett, Charles Roscoe; Shaak, Ray Ned; and Andrews, Daniel Marshall, 3,937,857.

Shackleton, Michael Allen; and Anderson, Roy Earl, to United States of America, Army. Automatic cleaning apparatus for fluid filters. 3,936,902, Cl. 15-304.000.

Shah, Hasmukh R.: *See—*
Jones, Thaddeus M.; Shah, Hasmukh R.; and Nash, Charles D., 3,937,926.

Shank, Herbert C., Jr., to Anchor Hocking Corporation. Method of making a color decorated, plastic coated glass article. 3,937,853, Cl. 427-29.000.

Shank, Herbert C., Jr., to Anchor Hocking Corporation. Method of making a thermoplastic ink decorated, polymer coated glass article. 3,937,854, Cl. 427-29.000.

Shapiro, L. Dennis: *See—*
Galvin, Aaron A.; and Shapiro, L. Dennis, 3,938,118.

Sharp, John Howard: *See—*
Parker, Alan James; Waghorne, Winfield Earle; Giles, Dion Ewing; Sharp, John Howard; Alexander, Robert; and Muir, David Michael, 3,937,657.

Sharp Kabushiki Kaisha: *See—*
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Sasaki, Takehiko; Yamamoto, Keizo; and Fukuda, Hiroaki, 3,937,928.

Sharples, John, to Rolls-Royce Motors Limited. Engine housings. 3,937,602, Cl. 418-83.000.

Shatto, Walter Clifton, Jr.: *See—*
Folk, Kenneth Foster; Ross, Milton Dean; and Shatto, Walter Clifton, Jr., 3,936,933.

Shavel, John, Jr.: *See—*
Strandtmann, Maximilian von; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, 3,937,704.

Shea, Peter: *See—*
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Shell Oil Company: *See—*
Baumgartner, Herman J.; and Balas, Jaroslav G., 3,937,759.
Pilgram, Kurt H. G., 3,937,627.

Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce F., to Shelley Manufacturing Company. Auger lift mechanism for automatic ice dispensers. 3,937,365, Cl. 222-241.000.

Shelley Manufacturing Company: *See—*
House, Bruce F., 3,937,361.
Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce F., 3,937,365.

Shelley, Robert J., Jr.: *See—*
Shelley, George R.; Shelley, Robert J., Jr.; Dixon, Arthur B.; and House, Bruce F., 3,937,365.

Shemano, Irving, to Richardson-Merrell Inc. Pharmaceutically useful nitrogen containing heterocyclic derivatives. 3,937,833, Cl. 424-267.000.

Shemano, Irving, to Richardson-Merrell Inc. Pharmaceutically useful sulfur containing heterocyclic derivatives. 3,937,835, Cl. 424-275.000.

Shemano, Irving, to Richardson-Merrell Inc. Method of treating conditions of delayed hypersensitivity using bis-basic substituted acenaphthene derivatives. 3,937,842, Cl. 424-330.000.

Sheppard, Chester Stephen: *See—*
Mac Leay, Ronald Edward; and Sheppard, Chester Stephen, 3,937,761.

Sheshtawy, Adel El. Self-propelling apparatus for well logging tools. 3,937,278, Cl. 166-63.000.

Shestak, Nikolai Antonovich: *See—*
Kononko, Vasily Porfirovich; Bondarev, Konstantin Timofeevich; Krivokon, Alexandr Alexandrovich; Kovshar, Nikolai Nikiforovich; Ivanova, Ljudmila Mikhailovna; Frolova, Elena Gavrilovna; Shestak, Nikolai Antonovich; and Shevchenko, Nikolai Leontievich, 3,937,623.

Shevchenko, Nikolai Leontievich: *See—*
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Shimada, Shojiro: *See—*
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Shimizu, Kazuyoshi, to Leader Denshi Kabushikikaisha. Dual trace display device. 3,938,003, Cl. 315-392.000.

Shimotsuma, Sakae; Asai, Takeo; Hosoi, Masahiro; Aoki, Hiroshi; and Masuda, Masanori, to Teijin Ltd. Biaxially oriented polyethylene-2,6-naphthalate film containing another polyester resin and process for its production. 3,937,754, Cl. 260-860.000.

Shinshu Miso Kabushiki Kaisha: *See—*
Koyama, Masakuni, 3,937,844.

Shirai, Kazunari: *See—*
Irikura, Tsutomu; Shirai, Kazunari; Tada, Mamoru; Tamada, Terumi; and Imai, Jun, 3,937,821.

Shirey, Frank W.: *See—*
Hewitt, William J.; Shirey, Frank W.; and Wilson, Mortimer D., 3,937,622.

Shizume, Peter K.: *See—*
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Shobert, Erle I., II, to Stackpole Carbon Company. Pulse keyboard switch. 3,937,992, Cl. 310-15.000.

Shonebarger, Francis J.; and Brown, William, to Anchor Hocking Corporation. Lubricity coating for plastic coated glass articles. 3,937,676, Cl. 260-23.00R.

Shourek, John Edward: *See—*
Shourek, Ruth W.; and Shourek, John Edward, 3,937,485.

Shourek, Ruth W.; and Shourek, John Edward. Collapsible luggage carrier. 3,937,485, Cl. 280-35.000.

Shryock, Stanley H.; George, Charles R.; and Cunningham, Willis C., to Halliburton Company. Method for cementing wells in low temperature formations. 3,937,282, Cl. 166-293.000.

Shuler, James Richard: *See—*
Becker, Danny J.; Boggs, Roger L.; Vaughn, Kenneth E.; and Shuler, James Richard, 3,937,529.

Sick, Erwin, to Erwin Sick Optik-Elektronik, Firma. Device for the continuous monitoring of the condition of the needle heads on a circular knitting machine. 3,937,038, Cl. 66-157.000.

Siegfried Peyer: *See—*
Schwartz, Hermann, 3,938,119.

Siemag Siegener Maschinenbau GmbH: *See—*
Alwes, Dieter; Eckardt, Helmut; Leiste, Hans Peter; and Melcher, Robert Albert, 3,937,447.

Siemens Aktiengesellschaft: *See—*
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Hermstein, Wolfgang; Rosenberger, Gerhard; and Muller, Willi, 3,938,039.
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Korn, Roland; Seyd, Gunter; and Paulsen, Uwe, 3,937,522.
Miericke, Jurgen; and Urankar, Laxmikant, 3,937,150.
Schabert, Hans-Peter; and Ropers, Johann, 3,937,651.
Schramm, Georg, 3,937,225.
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Siemens Aktiengesellshaft: *See—*
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Sievers, Jerry A.: *See—*
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Sievert, John A., to Continental Oil Company. In situ mining using bacteria. 3,937,520, Cl. 299-4.000.

Signetics Corporation: *See—*
Zemel, David Larry; and Kirk, Robert Gerald, 3,937,941.

Silagy, Richard J.: *See—*
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Silver, Robert H.: *See—*
United States of America, National Aeronautics and Space Administration; Feldstein, Cyril; Osher, Jules V.; Lewis, Gilbert W.; Silver, Robert H.; and Duran, Edward N., 3,937,212.

Simmons, Charles J. Toboggan rudder. 3,937,483, Cl. 280-21.00R.

Simmons, John Ernest, to EMI Limited. Moulding of gramophone records. 3,937,779, Cl. 264-106.000.

Simms, Dewey M., Jr., to Burroughs Corporation. Method for attaching extrusions and the like to frame members. 3,936,925, Cl. 29-446.000.

Simon, Klaus-P.: *See—*
Luhdorff, Dieter; Oehlerking, Bernd; Jaworsky, Hugo; Koth, Gerhard; and Simon, Klaus-P., 3,937,525.

Simpson, Paul A., to Cambridge Thermionic Corporation. Virtually zero power linear magnetic bearing. 3,937,148, Cl. 104-148.0MS.

Singer Company, The: *See—*
Eisenberg, Robert M., 3,938,051.
Jarmy, Howard I., 3,938,191.

Singlepoint U.S.A. Inc.: *See—*
Harris, Samuel G., 3,937,968.

Sirkin, Robert: *See—*
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Sisco, William C.; and Grabb, Frederick G., to Bendix Corporation, The. Hold off valve for a two stage servomotor. 3,937,021, Cl. 60-575.000.

Sisson, Margaret: *See—*
Crabtree, Delbert M., 3,936,982.

Skog, Egil: *See—*
Naslund, Ulf Vilheim; and Skog, Egil, 3,937,306.

Slautterback, Robert C., to Eltra Corporation. Battery with recessed terminals and fuse. 3,937,636, Cl. 136-135.00S.

Sleder, Richard L.; and Fitzner, Arthur O., to Brunswick Corporation. Breakerless and distributorless multiple cylinder ignition system. 3,937,200, Cl. 123-148.0CC.

Sloan, Benjamin Johnston, Jr., to Texas Instruments Incorporated. Process for fabricating dielectrically isolated semiconductor components of an integrated circuit. 3,938,176, Cl. 357-49.000.

Sloop, Conrad Beebe. Camera side strap. 3,938,166, Cl. 354-82.000.

Slota, Stanley A.; and Wegman, Raymond F., to United States of America, Army. Fatigue test apparatus. 3,937,071, Cl. 73-91.000.

Smead Manufacturing Company, The: *See—*
Fasbender, David J., 3,937,493.

Smeltz, Karen M.: *See—*
Allcock, Harry Rex; Gardner, James Earl, deceased; and Smeltz, Karen M., 3,937,790.

Smith, Anthony: *See—*
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Smith, Claude A.; and Williams, Donald L., to General Motors Corporation. Pressure vacuum relief valve assembly. 3,937,358, Cl. 220-203.000.

Smith, Herman P., to Emerson Electric Company. Electric cartridge heater with metal sleeve adapter. 3,937,923, Cl. 219-523.000.

Smith, Hubert L.: *See—*
Bergeron, Claude A.; and Smith, Hubert L., 3,937,644.

Smith, John William: *See—*
Durrant, Oliver W.; and Smith, John William, 3,937,024.

Smith, Trevor Stanley, to Lucas Aerospace Limited. Speed responsive governor arrangements. 3,937,106, Cl. 74-857.000.

Smither, Miles A., to General Electric Company. Power line data transmission system. 3,938,129, Cl. 340-310.00R.

Snam Progetti S.p.A.: *See—*
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Snamprogetti S.p.A.: *See—*
Lugli, Gabriele; Mazzei, Alessandro; and Modini, Gabriele, 3,937,692.

Snell, Stephen Charles, to Linear Systems Incorporated. Electromagnetically energized scanning frequency synthesizer. 3,937,972, Cl. 250-555.000.

Snia Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See—*
Donati, Ivo; Muench, Werner; and Fidecicchi, Mario, 3,937,789.

Sobel, Jay E., to Universal Oil Products Company. Maintaining HF solubility in alkylation isobutane recycle. 3,937,743, Cl. 260-683.480.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See—*
Valbonesi, Giuseppe, 3,938,086.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Laflaquiere, Regis; Janousek, Radovan; and Wettel, Albert, 3,936,995.

Societe Anonyme de Telecommunications: *See—*
Minot, Pierre Jean Marie, 3,938,057.

Societe anonyme dite: Hexachimie: *See—*
Cognacq, Jean-Claude, 3,937,832.

Societe Anonyme dite: L'Oreal: *See—*
Papantoniou, Christos; and Boulogne, Jean, 3,937,811.

Societe Anonyme: Poclain: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
Pech, Bernard M., 3,937,487.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Caruel, Jacques Emile Jules; Bedue, Jean Robert; and Cantaloube, Bernard Andre, 3,937,011.

Soderberg, Bo: *See—*
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Sodickson, Lester A.; and Lim, Franklin, to Damon Corporation. Apparatus for monitoring the rate of a chemical reaction. 3,937,614, Cl. 23-253.00R.

Sohl, Gordon: *See—*
Fender, William D.; and Sohl, Gordon, 3,937,421.

Soisson, Donald R. Congruent suspension twist swing. 3,937,463, Cl. 272-85.000.

Sola Basic Industries, Inc.: *See—*
Borkovitz, Henry S.; and Lucarz, William E., 3,938,033.

Solco Basel AG: *See—*
Jaeger, Karl-Heinz; and Mittenzwei, Hellmut, 3,937,816.

Solomons, Gerald L.; and Scammell, Gerald W., to Ranks Hovis McDougall Limited. Production of edible protein substances. 3,937,654, Cl. 195-35.000.

Soloway, Gerald Steven: *See—*
Borison, Victor Scott; Mattes, Hans George; McDowell, Colonel Blake, III; Schramm, George William; Soloway, Gerald Steven; and Wesner, John William, Jr., 3,938,090.

Solvay & Cie.: *See—*
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Asako, Tsunehiko; Soma, Takenobu; Masuya, Hirotomo; Harukawa, Tadatsugu; and Miki, Takuichi, 3,937,699.

Song, Ching-Long, to North Electric Company. Signal coding for telephone communication system. 3,937,897, Cl. 179-15.0AP.

Sony Corporation: *See—*
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Saito, Takahiko; Iwase, Koichi; and Shimada, Shojiro, 3,937,886.
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Sorenson, Billy L.: *See—*
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Soulas, Jacques; and Vilella, Paul, to Compagnie Industrielle des Telecommunications Cit-Alcatel. Sealed push-button control apparatus. 3,937,913, Cl. 200-302.000.

Southwire Company: *See—*
Blackstone, Michael; Maddox, Bryant K.; Rowland, Bobby A.; and Tate, Stanley L., 3,936,922.

Spanel, Abram N. Method and means of tufting. 3,937,156, Cl. 112-79.0FF.

Spanel, Abram N. Method and means of tufting. 3,937,158, Cl. 112-79.0FF.

Spanel, Abram N. Yarn clamping means for tufting apparatus. 3,937,159, Cl. 112-79.00R.

Spanel, Abram N.; Jacobs, David R.; and Buell, David N., to Spanel, Abram N. Yarn control and feeding apparatus. 3,937,160, Cl. 112-79.0FF.

Spanel, Abram N. Method and means of tufting. 3,937,643, Cl. 156-435.000.

Spanel, Abram N.: *See—*
Spanel, Abram Nathaniel; and Jacobs, David R., 3,937,157.

Spanel, Abram Nathaniel; and Jacobs, David R., to Spanel, Abram N. Method and means of tufting. 3,937,157, Cl. 112-79.0FF.

Sparks, Olin B. Box clip. 3,936,962, Cl. 40-23.00A.

SPA—Societa Prodotti Antibiotici S.p.A.: *See—*
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Spercel, Robert J. Bar stock loader and feed mechanisms. 3,937,331, Cl. 214-1.0PB.

Sperry Rand Corporation: *See—*
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Mortier, Frans Henri; Dekeyser, Willy Rene Evarist; and Sadler, Loren Gage, 3,936,994.

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Spieth, Ernst K.: *See—*
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Spulak, Reynold. Adjustable tire cart. 3,937,343, Cl. 214-332.000.

Stach, Leonard J., to Velsicol Chemical Corporation. Compositions and methods of killing insects and acarids using alkoxyimino carbamoyloxy phosphorus compounds. 3,937,824, Cl. 424-211.000.

Stache, Ulrich; Fritsch, Werner; Haede, Werner; and Lindner, Ernest, to Hoechst Aktiengesellschaft. 12-Dehydro digoxin-4'''-and 3'''-alkyl ethers. 3,937,697, Cl. 260-210.500.

Stackpole Carbon Company: *See—*
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Staehling, David M.: *See—*
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Stafford, R. Wayne; Tobey, William H.; and Clark, Benton C., III, to Martin Marietta Corporation. Non-contactive proximity sensor system utilizing nucleonic radiation fluorescence. 3,937,953, Cl. 250-272.000.

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH. 2-Phenylamino-imidazolines-(2). 3,937,717, Cl. 260-309.600.

Stahle, Helmut: *See—*
Koppe, Herbert; Kummer, Werner; Stahle, Helmut; Zeile, Karl; Engelhardt, Albrecht; and Traunecker, Werner, 3,937,706.

Stahle, Kurt, to Concordia Fluidtechnik GmbH Steuergerate. Device for monitoring control elements. 3,937,254, Cl. 137-637.000.

Staiger, Gerhard; Bronstert, Klaus; Schick, Hannes; Hennenberger, Peter; and Mueller-Tamm, Heinz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of poly (α-olefins). 3,937,691, Cl. 260-93.700.

Staker, William C.; and Lehnhoff, Richard N., to General Motors Corporation. DC to DC inverter circuit. 3,938,022, Cl. 321-2.000.

Stalberger, Robert John, Jr.; and Marshall, Michael David, to Stalberger, Robert John, Jr.; Marshall, Michael David; and Schneider, Clark, part interest to each. Game footbag. 3,937,470, Cl. 273-106.00R.

Staley, James G., to Wurlitzer Company, The. Electronic piano circuit arrangement. 3,937,115, Cl. 84-1.230.

Stalwart Dyeing Company Limited: *See—*
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Stamicarbon B.V.: *See—*
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Stamicarbon N.V.: *See—*
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Stampa, Ulrich: *See—*
Meier, Hans Justus; Sadowski, Herbert; and Stampa, Ulrich, 3,937,424.

Stan, Gerald N.; Toth, Leslie; and Rollinson, John E. Hydraulic safety circuit. 3,937,016, Cl. 60-325.000.

Standard Container Company: *See—*
Ascoli, Fred; and Hermann, Robert R., 3,937,645.

Standard-Farrington Alarm & Signal Corporation: *See—*
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Standex International Corporation: *See—*
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Stanek, Eldon Keith: *See—*
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Stanford Research Institute: *See—*
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Stanley, Robert K.: *See—*
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Stannow, Jorgen; Kjeldsen, Kjeld; Karll, Bent; and Nissen, Ole Joker, to Danfoss A/S. Encased refrigerating machine. 3,937,598, Cl. 417-363.000.

Stansfield, Garry A. G., to Burroughs Corporation. Parity checking a double-frequency coherent-phase data signal. 3,938,083, Cl. 340-146.1AG.

Stark, Lawrence: *See—*
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Starling, James G.: *See—*
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Stauffer Chemical Company: *See—*
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Toy, Arthur D. F.; and Eilers, Kenneth L., 3,937,765.

Steel, John F. Structure and method for mounting curtain walls. 3,936,986, Cl. 52-235.000.

Steel, Robert B., to General Electric Company. Method of nondestructively testing aluminum-to-copper welds. 3,937,073, Cl. 73-101.000.

Steigerwald, Klaus: *See—*
Urban, Friedrich; Buechner, Oskar; Steigerwald, Klaus; Fauth, Karl-Heinz; and Gehrig, Heinz, 3,937,772.

Steiman, Wolf, to VCA Corporation. Hand-held pump type dispenser. 3,937,366, Cl. 222-321.000.

Steiner, Louis Kent, to Control Data Corporation. Virtual addressing apparatus for addressing the memory of a computer utilizing associative addressing techniques. 3,938,100, Cl. 340-172.500.

Steinitz, Kurt. Electronic air purifier with ozone suppression. 3,937,967, Cl. 250-435.000.

Steinwart, Johannes: *See—*
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Steklovsky, Vladimir Konstantinovich: *See—*
Reznik, Vladimir Savich; Pashkurov, Nikolai Grigorievich; Muslinkin, Abdurakhim Abdurakhimovich; Zhurkina, Elena Nikolaevna; Goloschapov, Nikolai Mikhailovich; and Steklovsky, Vladimir Konstantinovich, 3,937,829.

Stelzer, William: *See—*
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Stephanoff, Nicholas N., to Fluid Energy Processing and Equipment Company. Apparatus for mixing pulverizing and grinding black powder. 3,937,405, Cl. 241-39.000.

Stern, Herman Abraham, to RCA Corporation. Method of making electrical connections for liquid crystal cells. 3,936,930, Cl. 29-592.000.

Steuer, Werner: *See—*
Schulz, Horst; Hild, Erich; Steuer, Werner; Schmidt, Karl-Heinz; Eisend, Ewald; Loffler, Karlheinz; Flosser, Josef; and Kessler, Reinhard, 3,937,309.

Stewart, Bruce E.; and Carr, Keith E., to Whirlpool Corporation. Vacuum cleaner suction tool. 3,936,905, Cl. 15-416.000.

Stewart, Clive Edward Ernest, to International Standard Electric Corporation. Radio frequency preparation of pure glass. 3,937,625, Cl. 65-136.000.

Stewart, Donald J.; and Streib, Richard A., to United Technologies Corporation. Variable area engine inlet. 3,937,238, Cl. 137-15.100.

Stewart, Keith B.: *See—*
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Stewart, Ned L. Anchoring apparatus. 3,937,436, Cl. 248-499.000.

Stewart, Ned L. Flush mounting drive anchor. 3,937,437, Cl. 248-499.000.

Stewart-Warner Corporation: *See—*
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Stewart, William H., Jr.: *See—*
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Stockhaus, Klaus: *See—*
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Stockton, Archibald Dicks, Jr. Variable vent cover for cooking vessels. 3,937,359, Cl. 220-369.000.

Strack, Carlo: *See—*
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Strandtmann, Maximilian von; Shavel, John, Jr.; Klutchko, Sylvester; and Cohen, Marvin, to Warner-Lambert Company. 3-(Methylsulfinyl)cinnolinones and their derivatives. 3,937,704, Cl. 260-250.00C.

Strang, Elmer J.: *See—*
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Strike, Donald P.; Kao, Wenling; and Fenichei, Richard L., to American Home Products Corporation. Method for attenuating bleeding. 3,937,839, Cl. 424-317.000.

Strobel, Albert F., to GAF Corporation. Sun tanning and hari protecting acid salts of aminomethyl-O-hydroxyphenones compositions. 3,937,808, Cl. 424-59.000.

Struck, Robert T.: *See—*
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Stuart, Robert B., to Penn Yan Boats, Incorporated. Deep-V tunnel stern boat. 3,937,173, Cl. 115-39.000.

Studer, Altee C. Drain jointing system. 3,937,497, Cl. 285-111.000.

Stumpner, Gerhard, to Siemens Aktiengesellschaft. Procedure to determine the temporal mean of a quantity to be measured, as a function of its period of operation. 3,937,931, Cl. 235-92.0EC.

Sturges, James R., to Caterpillar Tractor Co. Reversible track link with clamped-on shoe. 3,937,530, Cl. 305-54.000.

Sturtevant, Paul A. Effluent disposal system. 3,936,888, Cl. 4-10.000.

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Subrizi, Angelo; and Violino, Ettore, to Ing. C. Olivetti & C., S.p.A. System for putting an information record onto a magnetic substrate. 3,938,187, Cl. 340-172.500.

Sudhir, Gopinath, to Chrysler Corporation. Roll-over valve and vapor separator. 3,937,198, Cl. 123-136.000.

Sudler, Roland: *See—*
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Suetterlin, Norbert: *See—*
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Sukup, Eugene G. Cable take up for traversing mechanisms. 3,937,308, Cl. 191-12.20R.

Sullivan, Joseph T., to Standard-Farrington Alarm & Signal Corporation. Gas-powered alarm with pressure responsive remote indicator circuit. 3,938,114, Cl. 340-227.100.

Sullivan, Philip E. Collection device. 3,937,259, Cl. 141-98.000.

Sumitomo Chemical Company, Limited: *See—*
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Sunnen, Jean Albert; and Schoumaker, Henry Rene, to La Soudure Electrique Autogene, Procedes Arcos. Process of striking an arc for a plasma beam inside an enclosure and a stick-electrode for carrying out the process. 3,937,866, Cl. 13-9.00R.

Surgical Design Corporation: *See—*
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Susaki, Kazumichi: *See—*
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Swift, Gilbert: *See—*
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Synestructics, Inc.: *See—*
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Szent-Miklosy, Balint, Jr. Personalized rapid transit system. 3,937,147, Cl. 104-93.000.

Szepvolgyi, Janos: *See—*
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Tabet, Michael A., to Burton, Hughes D., a part interest. Alarm device. 3,938,127, Cl. 340-304.000.

Tacke, William H., to Curtis Products Lt. Wire rod chair base. 3,937,434, Cl. 248-188.700.

Tada, Mamoru: *See—*
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Tajima Roofing Co., Ltd.: *See—*
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Takahashi, Isoji: *See—*
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Takazawa, Ietsugu. Curtain stopping device. 3,936,906, Cl. 16-87.40R.
Takeda Chemical Industries, Ltd.: *See—*
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Tamaki, Sigeo; and Itoh, Tomoo, to Hitachi, Ltd. Alarm apparatus for circulating exhaust gas flow control device. 3,937,194, Cl. 123-119.00A.
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Tanaka, Shoichi, to Toshiba Kikai Kabushiki Kaisha. Method of vacuum-pressure injection moulding. 3,937,778, Cl. 264-102.000.
Tanaka, Toyozo; Kubota, Shigeyoshi; and Kunieda, Masao, to Unitika Limited. Carding method and machine. 3,936,910, Cl. 19-102.000.
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Tanimoto, Kenji, to Fuji Xerox Co., Ltd. Braking circuit for use with phase synchronizing circuitry. 3,937,883, Cl. 178-69.50F.
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Taylor, Donald M. Sanding fixture for producing circular parts. 3,936,983, Cl. 51-216.00T.
Taylor, John Sassons, to Joseph Lucas (Industries) Limited. Gear pump or motor with axially movable bearing blocks. 3,937,604, Cl. 418-132.000.
Teach, Eugene G., to Stauffer Chemical Company. Meta-bis anilide derivatives and their utility as herbicides. 3,937,729, Cl. 260-557.00R.
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Thomas, Richard, deceased; and by Thomas, Betty M., executrix, to Thomas, Betty; and Hansen, Helen. Continuous motion picture projector apparatus. 3,937,567, Cl. 352-27.000.
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Throckmorton, Peter E.; Frey, Sari; and Grote, Dace, to Ashland Oil, Inc. Process for preparing N, N-dimethylurea. 3,937,727, Cl. 260-553.00R.
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Vetco Offshore Industries, Inc.: *See—*
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Wang, Hong Wen. Multi-combination push button lock. 3,937,046, Cl. 70-81.000.

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Warner, Glenfield, to Lawrence Peska Associates, Inc., a part interest. Driver alert device. 3,938,123, Cl. 340-279.000.

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Weinhold, Karl. Pipe coupling. 3,937,501, Cl. 285-365.000.

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Weisgerber, Gregor; and Trautvetter, Werner, to Dynamit Nobel Aktiengesellschaft. Process for the preparation of thermoplastically workable fluoro-olefin polymers. 3,937,690, Cl. 260-86.300.

Weiss, Aaron L.: *See—*
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Weiters, Albert W. Tip over control for three wheeled vehicles. 3,937,486, Cl. 280-87.00R.

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Wetterlin, Kjell Ingvar Leopold; and Svensson, Leif Ake, to Aktiebolaget Draco. Orally active bronchospasmolytic compounds and their preparation. 3,937,838, Cl. 424-311.000.

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White, Velton C. Dental model trimmer. 3,936,981, Cl. 51-125.000.

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Whiteford, Carlton L., to Creative Tools, Inc. Container for marine storage of tools. 3,937,324, Cl. 206-349.000.

Wibroe, Tab, to Raymond Lee Organization, Inc., The, a part interest. Toilet flush mechanism. 3,936,889, Cl. 4-37.000.

Wickstrom, Carl Ervine. Method for extinguishing cigarettes and apparatus. 3,937,229, Cl. 131-256.000.

Wideman, Lawson G.; and Menapace, Henry R., to Goodyear Tire & Rubber Company, The. Selective hydrogenation of cyclopentadiene. 3,937,745, Cl. 260-666.00A.

Wiedemann, Wolfgang; and Platte, Friedrich, to Wasagchemie GmbH. Method for the production of mealy crude black powder which can be further processed. 3,937,770, Cl. 264-3.00C.

Wiedmann, Roland: *See—*
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Wienand, Michael; Hasberg, Jurgen; and Alfter, Franz-Werner, to Dynamit Nobel AG. Process for the production of sheets of foamed thermoplastics synthetic resins. 3,937,777, Cl. 264-53.000.

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Williams, Gerald J., to General Oceanus, Inc. Sensing apparatus for inclinometers. 3,937,078, Cl. 73-189.000.

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Williamson, James T. Waste and organic garbage disposal system without out-fall line or smoke stack. 3,937,023, Cl. 60-670.000.

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	131	B 510,346	Feb. 10, 1976
	154	B 414,971	Feb. 10, 1976
D9 –	71	B 491,906	Feb. 10, 1976
D12 –	60	B 527,788	Feb. 10, 1976
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287 3,937,318

CLASS 200
16C 3,937,909
35R 3,937,910
61.39 3,937,911
82C 3,937,912
302 3,937,913

CLASS 202
262 3,937,656

CLASS 204
108 3,937,657
119 3,937,658
159.2 3,937,659

CLASS 206
45.13 3,937,319
75 3,937,320
84 3,937,321
216 3,937,322
306 3,937,323
349 3,937,324
387 3,937,325
465 3,937,326
507 3,937,327
521 3,937,328

CLASS 208
140 3,937,660

CLASS 209
250 3,937,661

CLASS 210
23 3,937,662
493R 3,937,663

CLASS 211
41 3,937,329

CLASS 213
166 3,937,330

CLASS 214
1PB 3,937,331
1P 3,937,332
1Q 3,937,333
2.5 3,937,334
6DS 3,937,335
6P 3,937,336
80 3,937,337
83.36 3,937,338
140 3,937,339
147G 3,937,340
152 3,937,167
3,937,341
304 3,937,342
332 3,937,343
505 3,937,344
510 3,937,345
730 3,937,346

CLASS 215
213 3,937,347
252 3,937,348
254 3,937,349
361 3,937,350

CLASS 219
67 3,937,914
68 3,937,915
104 3,937,916
121P 3,937,917
125R 3,937,918
216 3,937,919
286 3,937,920
494 3,937,921
501 3,937,922
523 3,937,923

CLASS 220
3 3,937,351
3.94 3,937,352
9LG 3,937,353
63R 3,937,354
3,937,355
73 3,937,356
203 3,937,357
3,937,358
369 3,937,359

CLASS 221
11 3,937,360
242 3,937,361

CLASS 222
20 3,937,362
105 3,937,363
190 3,937,364
241 3,937,365
321 3,937,366
399 3,937,367
402.11 3,937,368
410 3,937,369
464 3,937,370
494 3,937,371
504 3,937,372

CLASS 224
26R 3,937,373
32A 3,937,374
42.07 3,937,375
42.08 3,937,376

CLASS 225
94 3,937,377

CLASS 226
55 3,937,378
150 3,937,379

CLASS 227
100 3,937,380

CLASS 228
6 3,937,381
49 3,937,382
115 3,937,383
120 3,937,384
131 3,937,385
180 3,937,386
193 3,937,387
222 3,937,388

CLASS 229
2.5R 3,937,389
23R 3,937,390
28R 3,937,391
41C 3,937,392
51TC 3,937,393
54R 3,937,394
62.5 3,937,395
3,937,396

CLASS 233
3 3,937,397

CLASS 235
61.11E 3,937,928
61.11R 3,937,927
3,937,929
61.6R 3,937,924
61.7B 3,937,925
61.7R 3,937,926
78R 3,937,930
92EC 3,937,931
92PE 3,937,932
150.3 3,937,933
151.21 3,937,934
153AE 3,937,936
153AK 3,937,935
3,937,938
153R 3,937,937
156 3,937,939
3,937,940
159 3,937,941
181 3,937,942
183 3,937,943
184 3,937,944
3,937,945

CLASS 236
38 3,937,398

CLASS 239
1 3,937,399
11 3,937,400
15 3,937,401
70 3,937,402
567 3,937,404

CLASS 240
1.3 3,937,946
10.1 3,937,947
78R 3,937,948

CLASS 241
39 3,937,405
46.11 3,937,406
282.2 3,937,408

CLASS 242
18R 3,937,409
66 3,937,410
68.3 3,937,411
72B 3,937,412
86.5R 3,937,413
3,937,414
106 3,937,415
107.4A 3,937,416
107.4R 3,937,418
118.4 3,937,419
147R 3,937,417
158.4A 3,937,420
182 3,937,421
204 3,937,422

CLASS 244
3.22 3,937,423
53R 3,937,424
123 3,937,425
151R 3,937,407
153R 3,937,426

CLASS 246
34CT 3,937,427
34R 3,937,428
169A 3,937,429
182B 3,937,430
3,937,431
187B 3,937,432

CLASS 248
19 3,937,433
188.7 3,937,434
464 3,937,435
499 3,937,436
3,937,437

CLASS 249
117 3,937,438

CLASS 250
199 3,937,949
201 3,937,950
209 3,937,951
227 3,937,952
272 3,937,953
282 3,937,954
283 3,937,955
290 3,937,956
305 3,937,957
307 3,937,958
311 3,937,959
326 3,937,960
328 3,937,961
346 3,937,962
363 3,937,963
366 3,937,964
3,937,965
393 3,937,966
435 3,937,967
467 3,937,968
505 3,937,969
515 3,937,970
3,937,971
555 3,937,972

CLASS 251
11 3,937,439
61.1 3,937,440
298 3,937,441
328 3,937,442

CLASS 252
64 3,937,664
162 3,937,665
301.1S 3,937,667
301.2R 3,937,666
316 3,937,668
432 3,937,669
519 3,937,670

CLASS 254
10B 3,937,443

CLASS 259
4R 3,937,445
40 3,937,444
105 3,937,446
191 3,937,447

CLASS 260
2.3 3,937,671
3,937,675
17.3 3,937,672
18TN 3,937,673
19UA 3,937,674
23R 3,937,676
23.7A 3,937,677
28.5R 3,937,678
29.3 3,937,679
29.6TA 3,937,680
33.6AQ 3,937,681
42.24 3,937,682
42.47 3,937,683
46.5G 3,937,684
47EP 3,937,685
78R 3,937,686
3,937,687
3,937,688
78.5UA 3,937,689
86.3 3,937,690
93.7 3,937,691
94.3 3,937,692
112R 3,937,693
112.5LH 3,937,695
112.5R 3,937,694
192 3,937,696
210.5 3,937,697
211.5R 3,937,698
239.1 3,937,699
239.55R 3,937,700
240G 3,937,701
247.1S 3,937,702
248NS 3,937,703
250C 3,937,704
251QB 3,937,705
254 3,937,706
267 3,937,707
268PH 3,937,708
293.53 3,937,709
293.86 3,937,711
296AE 3,937,712
297R 3,937,710
305 3,937,713
3,937,714
306.8D 3,937,715
307FA 3,937,716
309.6 3,937,717
326.4 3,937,718
345.2 3,937,719
397.45 3,937,720
456A 3,937,721
465F 3,937,722
488R 3,937,723
501.19 3,937,732
502.4P 3,937,724
513R 3,937,725
553A 3,937,726
553R 3,937,727
555R 3,937,728
557R 3,937,729
561R 3,937,733
562B 3,937,730
566F 3,937,731
586P 3,937,735
586R 3,937,734
590FA 3,937,736
592 3,937,737
593H 3,937,738
604R 3,937,739
621M 3,937,741
621R 3,937,740
632HF 3,937,742
656R 3,937,744
666A 3,937,745
669R 3,937,746
680E 3,937,748
680R 3,937,747
683.48 3,937,743
3,937,749
830TW 3,937,750
835 3,937,751
857TW 3,937,752
860 3,937,753
3,937,754
3,937,755
869 3,937,756
873 3,937,757
876B 3,937,758
879 3,937,759
880B 3,937,760
885 3,937,761
889 3,937,762
3,937,763
895 3,937,764
973 3,937,765

CLASS 261
41B 3,937,767
41D 3,937,766
44R 3,937,768
97 3,937,769

CLASS 264
3C 3,937,770
3E 3,937,771
12 3,937,772
17 3,937,773
26 3,937,774
29 3,937,775
40 3,937,776
53 3,937,777
102 3,937,778
106 3,937,779
274 3,937,780
314 3,937,781

CLASS 266
6S 3,937,448
29 3,937,449

CLASS 267
113 3,937,450

CLASS 269
45 3,937,451

CLASS 270
39 3,937,452

CLASS 271
4 3,937,453
6 3,937,454
10 3,937,455
64 3,937,456
92 3,937,457
95 3,937,458
173 3,937,459

CLASS 272
60R 3,937,461
83R 3,937,462
85 3,937,463

CLASS 273
26R 3,937,464
29A 3,937,465
32R 3,937,466
59R 3,937,467
84 3,937,468
85F 3,937,469
106R 3,937,470
131AC 3,937,471
157R 3,937,472
173 3,937,474
176FA 3,937,475
183B 3,937,473

CLASS 274
39A 3,937,476

CLASS 277
25 3,937,477
171 3,937,478

CLASS 280
3 3,937,479
11.35C 3,937,481
11.35T 3,937,480
18 3,937,482
21R 3,937,483
35 3,937,485
87R 3,937,486
150AB 3,937,488
150SB 3,937,487
204 3,937,489
242WC 3,937,490

CLASS 281
15B 3,937,491

CLASS 282
25 3,937,492

CLASS 283
41 3,937,493

CLASS 285
13 3,937,494
41 3,937,495
52 3,937,496
111 3,937,497
243 3,937,498
319 3,937,499
323 3,937,500
365 3,937,501

CLASS 290
2 3,937,973
46 3,937,974

CLASS 292
153 3,937,503
164 3,937,504
201 3,937,505
300 3,937,506
319 3,937,507

CLASS 293
63 3,937,508

CLASS 294
1R 3,937,509
16 3,937,510
3,937,511
19R 3,937,512
82R Re.28,709
86A 3,937,513
88 3,937,514
3,937,515

CLASS 296
26 3,937,516
68 3,937,517

CLASS 297
61 3,937,518
347 3,937,519

CLASS 298
11 3,937,502

CLASS 299
4 3,937,520

CLASS 302
3 3,937,521
56 3,937,522

CLASS 303
6C 3,937,523
21BE 3,936,941
21A 3,937,526
21F 3,937,524
21P 3,937,525
22R 3,937,975
40 3,937,527

CLASS 305
21 3,937,528
54 3,937,529
3,937,530

CLASS 307
10AT 3,937,976
38 3,937,977
41 3,937,978
88.3 3,937,979
120 3,937,980

141 3,937,981
205 3,937,982
3,937,983
221C 3,937,984
221D 3,937,985
228 3,937,986
235W 3,937,987
237 3,937,988
252B 3,937,989

CLASS 308

3.008 3,937,531
6C 3,937,532
10 3,937,533
135 3,937,534
191 3,937,535
206 3,937,536
207R 3,937,538
214 3,937,539
222 3,937,540
235 3,937,541

CLASS 310

8.3 3,937,990
9.1 3,937,991
15 3,937,992
46 3,937,993
168 3,937,994

CLASS 312

204 3,937,537

CLASS 313

49 3,937,995
217 3,937,996
418 3,937,997
487 3,937,998

CLASS 315

169TV 3,937,999
205 3,938,000
381 3,938,001
389 3,938,002
392 3,938,003
411 3,938,004

CLASS 317

13R 3,938,005
18C 3,938,006
27R 3,938,007
31 3,938,008
148.5R 3,938,009
155.5 3,938,010
157.5MR 3,938,011
249T 3,938,012

CLASS 318

92 3,938,013
138 3,938,014
139 3,938,015
467 3,938,016
610 3,938,017

CLASS 320

2 3,938,018
21 3,938,019
3,938,020
40 3,938,021

CLASS 321

2 3,938,022
3,938,023
3,938,024
3,938,025
27R 3,938,026
45C 3,938,027

CLASS 322

28 3,938,028

CLASS 323

2 3,938,029
23 3,938,031
24 3,938,032
50 3,938,030
60 3,938,033

CLASS 324

20R 3,938,034
30B 3,938,035
34R 3,938,036
3,938,037
71CP 3,938,038
96 3,938,039
119 3,938,040
158R 3,938,041
186 3,938,042

CLASS 325

18 3,938,043
22 3,938,044
163 3,938,045
362 3,938,046
396 3,938,047
455 3,938,048

CLASS 328

162 3,938,049
163 3,938,050
187 3,938,051

CLASS 329

104 3,938,052

CLASS 330

17 3,938,053
30D 3,938,054
3,938,055
43 3,938,056
78 3,938,057

CLASS 331

94.5C 3,938,058
111 3,938,059

CLASS 332

7.51 3,938,060
45 3,938,061

CLASS 333

30R 3,938,062
3,938,063
73S 3,938,064

CLASS 335

24 3,938,065
154 3,938,066

CLASS 337

159 3,938,067
189 3,938,068

CLASS 338

21 3,938,069
60 3,938,070

CLASS 339

3R 3,937,542
6R 3,937,543
21R 3,937,544
60R 3,937,545
61R 3,937,546
74R 3,937,547
95D 3,937,548
97C 3,937,403
3,937,549
97L Re.28,710
198G 3,937,550
210M 3,937,551
213R 3,937,552
258R 3,937,553

CLASS 340

15 3,938,071
15.5TS 3,938,073
15.5R 3,938,072
52R 3,938,074
3,938,075
58 3,938,076
3,938,077
3,938,078
64 3,938,079
114B 3,938,080
146.1AB 3,938,084
146.1AG 3,938,083
146.1AQ 3,938,085
146.1D 3,938,082
3,938,086
146.1R 3,938,081
146.2 3,938,087
146.3B 3,938,088
146.3D 3,938,089
146.3Z 3,938,186
149A 3,938,090
3,938,091
150 3,938,092
152R 3,938,093
172.5 3,938,094
3,938,095
3,938,096
3,938,097
3,938,098
3,938,099
3,938,100
3,938,101
3,938,102
3,938,103
3,938,104
3,938,105
3,938,106
3,938,187
173PL 3,938,107
173R 3,938,108
3,938,109
174TF 3,938,110
3,938,111
195 3,938,112
200 3,938,113
227.1 3,938,114
237S *3,938,115
242 3,938,116
244R 3,938,117
258R 3,938,118
259 3,938,119
274R 3,938,120
3,938,121
275 3,938,122
279 3,938,123
280 3,938,124
3,938,125
3,938,126
304 3,938,127
309.1 3,938,128
310R 3,938,129
321 3,938,132
324A 3,938,130
324M 3,938,133
3,938,134
3,938,135
3,938,136
3,938,137
324R 3,938,131
3,938,138
3,938,139
336 3,938,140
347AD 3,938,188
384R 3,938,141
388 3,938,142
402 3,938,143
413 3,938,144

CLASS 343

5W 3,938,145
6.5LC 3,938,146
7PF 3,938,147
7A 3,938,148
17.1R 3,938,149
17.7 3,938,150
18A 3,938,152
18B 3,938,151
100LE 3,938,153
3,938,154
107 3,938,155
207 3,938,156
756 3,938,157
3,938,158
3,938,159
778 3,938,160
829 3,938,161
840 3,938,162

CLASS 346

75 3,938,163
110R 3,938,164

CLASS 350

3.5 3,937,554
3,937,555
30 3,937,556
96BC 3,937,561
96WG 3,937,559
96B 3,937,558
96C 3,937,557
3,937,560
184 3,937,562
289 3,937,563
320 3,937,564
3,937,565

CLASS 351

40 3,937,566

CLASS 352

27 3,937,567

CLASS 353

68 3,937,568
116 3,937,569

CLASS 354

50 3,938,165
82 3,938,166
86 3,938,167
247 3,938,168
268 3,938,169
288 3,938,170
299 3,938,171

CLASS 355

3DD 3,937,570
3R 3,937,571
16 3,937,572
83 3,937,573

CLASS 356

4 3,937,574
5 3,937,575
74 3,937,576
85 3,937,577
106LR 3,937,578
144 3,937,579
156 3,937,580
246 3,937,581

CLASS 357

18 3,938,172
19 3,938,173
23 3,938,174
26 3,938,175
49 3,938,176
72 3,938,177
91 3,938,178

CLASS 358

4 3,938,179
8 3,938,180
38 3,938,181

CLASS 360

8 3,938,189
26 3,938,182
31 3,938,183
51 3,938,184
69 3,938,185
71 3,938,194
72 3,938,190
93 3,938,195
102 3,938,191
133 3,938,192
137 3,938,193

CLASS 401

134 3,937,582
197 3,937,583

CLASS 403

256 3,937,584
300 3,937,585

CLASS 408

147 3,937,586
181 3,937,587

CLASS 415

17 3,937,588
101 3,937,589
119 3,937,590
157 3,937,591
194 3,937,592

CLASS 416

214A 3,937,593
223A 3,937,594
244R 3,937,595

CLASS 417

36 3,937,596
216 3,937,597
363 3,937,598
389 3,937,599
416 3,937,600

CLASS 418

61B 3,937,601
83 3,937,602
117 3,937,603
132 3,937,604
219 3,937,605

CLASS 423

8 3,937,783
19 3,937,784
53 3,937,785
136 3,937,786
242 3,937,787
3,937,788
300 3,937,790
325 3,937,782
328 3,937,791
344 3,937,792
514 3,937,793
549 3,937,789
561 3,937,794
573G 3,937,795
580 3,937,796
610 3,937,797
659 3,937,798

CLASS 424

1 3,937,799
4 3,937,800
10 3,937,801
47 3,937,802
49 3,937,803
52 3,937,804
3,937,805
3,937,806
3,937,807
59 3,937,808
60 3,937,809
62 3,937,810
64 3,937,811
89 3,937,812
93 3,937,813
3,937,814
94 3,937,815
95 3,937,816
115 3,937,817
177 3,937,819
178 3,937,820
180 3,937,821
181 3,937,822
210 3,937,823
211 3,937,824
217 3,937,825
219 3,937,826
243 3,937,827
246 3,937,828
250 3,937,829
254 3,937,830
263 3,937,831
267 3,937,832
3,937,833
273 3,937,834
275 3,937,835
283 3,937,836
3,937,837
311 3,937,838
317 3,937,839
324 3,937,840
327 3,937,841
330 3,937,818
3,937,842

CLASS 425

28D 3,937,606
111 3,937,607
159 3,937,608
210 3,937,609
242B 3,937,610

CLASS 426

46 3,937,843
3,937,844
53 3,937,845
69 3,937,846
231 3,937,847
439 3,937,848
442 3,937,849
484 3,937,850
540 3,937,851
560 3,937,852

CLASS 427

29 3,937,853
3,937,854
54 3,937,855
58 3,937,856
98 3,937,857
431 3,937,858

CLASS 428

194 3,937,859
228 3,937,860
235 3,937,861
409 3,937,862
410 3,937,863
411 3,937,864
413 3,937,865

CLASSIFICATION OF DESIGNS

D 2— 315 238,723
361 238,724
381 238,725
D 6— 20 238,726
24 238,727
63 238,728
90 238,729
96 238,730
97 238,731
99 238,732
238,733
103 238,734
114 238,735
185 238,736
186 238,737
194 238,738
D 7— 1 238,739
27 238,740
121 238,741
166 238,742
211 238,743
D 8— 21 238,744
47 238,745
51 238,746
238,747
137 238,748
221 238,749
D 9— 1 238,750
18 238,751
48 238,752
60 238,753
86 238,754
171 238,755
231 238,756
D10— 30 238,757
38 238,758
238,759
40 238,760
64 238,761
238,762
D12— 7 238,763
238,764
62 238,765
114 238,766
136 238,767
146 238,768
153 238,769
154 238,770
156 238,771
169 238,772
238,773
170 238,774
212 238,775
D13— 1A 238,778
H 238,777
J 238,776
D19— 92 238,779
D22— 6 238,780
8 238,781
D23— 4 238,782
97 238,783
238,784
146 238,785
D26— 1R 238,786
5C 238,787
238,788
14G 238,789
D29— 23A 238,791
R 238,790
D30— 42 238,792
D34— 5FG 238,793
13A 238,794
14D 238,795
15AG 238,805
AJ 238,798
238,799
238,800
238,801
AT 238,803
JJ 238,797
B 238,804
M 238,802
R 238,796
41 238,806
5 238,807
4E 238,808
238,809
17 238,810
19N 238,811
5 238,812
D47— 3R 238,813
D52— 1E 238,814
D55— 4B 238,815
D56— 1A 238,817
D61— L 238,816
Q 238,818
4 238,819
D67— 1 238,820
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*NOTE: To be issued Feb. 11, 1976.

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		238,762	9	:	238,788	31	:	238,755		238,787	
		238,771			238,827	33	:	238,745		238,817	
		238,786	12	:	238,794	34	:	238,781		238,818	
		238,791	17	:	238,735			238,803	39	: 238,726	
		238,792			238,785			238,820		238,790	
		238,797	19	:	238,813			238,823		238,796	
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PLANT PATENTS

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Elliot L. Richardson, Secretary

PATENT AND TRADEMARK OFFICE
C. Marshall Dann, *Commissioner*